# Advanced Installation Meter User's Manual

DIRECTV®

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## Warranty

Trilithic, Inc. warrants that each part of this product will be free from defects in materials and workmanship, under normal use, operating conditions and service, for a period of fifteen (15) months from date of shipment. The obligation of Trilithic, Inc. under this warranty shall be limited, at the sole option of Trilithic, Inc., to replacing the product or repairing any defective part.

This warranty and the rights created hereunder are neither transferable nor assignable without the prior written consent of Trilithic, Inc.

Replaceable items such as batteries, soft cases, and input connectors, etc. are not included nor covered by this warranty.

The remedy set forth herein shall be the only remedy available to the Buyer under this warranty, and, in no event, shall Trilithic, Inc. be liable for incidental or consequential damages for any alleged breach of this warranty. This Warranty shall not apply to any part of the product that, without fault of Trilithic, Inc., has been subsequently altered or modified, nor shall it apply to any failure caused by a part not supplied by Trilithic, Inc. and subsequently attached to or incorporated into the product. This warranty shall not apply to any damage caused by accident, fire, or other casualty, negligence, misuse, or to any cause whatsoever other than as a result of a defect directly attributable to Trilithic, Inc.

Except for the warranty and exclusions set forth above, and the warranties, if any, available to the buyer from those who supply Trilithic, Inc., there are no warranties, express or implied (including, without limitation, any implied warranty or warranty of merchantability of fitness for a particular purpose), with respect to the condition of the product.

## Return Policy

Before returning a product for service, please call Trilithic Customer Service at 888-895-7630 for an RMA number. During this call, a Product Service Representative will schedule your unit for service, note the nature of the problem, and provide instructions for the return of your product.

All AIM service will be provided by Trilithic at:

Trilithic, Inc.
9710 Park Davis Drive
Indianapolis, In. 46235 USA
Phone: (888) 895-7630
Fax: (317) 895-3613
email: service@trilithic.com

# 1 Getting Started

## Introduction

Congratulations on your new Advanced Installation Meter (AIM)! The AIM was developed in collaboration with DIRECTV to provide customized features for installing and troubleshooting DIRECTV satellite receiver systems.

The AIM is a rugged meter suitable for both indoor and outdoor use. When fully charged, the AIM can be used to install satellite receiver systems in approximately six single-family homes on a single charge. Both an AC power adapter and a convenient vehicle power adapter are provided for charging the meter. The carrying case protects the meter and its accessories during transport and storage.

The AIM's large display and keypad make it easy to navigate to the features you need. On-screen directions guide you through ODU installation, Extended Installation Verification (EIV), and other test processes.

The AIM lets you track information for each account, including account settings and test results. You can transfer this information from the meter to a PC using a USB flash drive. Using its USB connection, the AIM can be easily updated in the field as new features become available.

# Using This Manual

## Overview

Read this manual completely before using your AIM. Also, retain this manual for future reference.

For information to help you get started using your AIM, see the sections below:

- **Getting to Know Your Meter**, starting on page 5.

  This section provides an overview of the AIM, including information about the meter and its accessories, its display and buttons, and how to navigate through the screens on the meter.

- **Powering Your Meter**, starting on page 10.

  This section provides instructions for how to turn on and turn off the meter, an overview of the meter's power-saving features, and instructions for how to charge the battery and replace the battery.

- **Getting Technical Support**, starting on page 17.

  This section describes how to access technical support.

- **Safety Instructions**, starting on page 18.

  This section provides important safety instructions for using the AIM.

- **Technical Specifications**, starting on page 19.

  This section provides information about the dimensions, capabilities and operating range of the AIM.

- **Spare Parts List**, starting on page 20.

  This section provides a list of replacement parts that can be ordered for the AIM.

Instructions for using the AIM's features are provided in the following chapters:

- **Chapter 2: Setting Up the Meter**, starting on page 21.

  Before you use your AIM, you need to enter registration information and confirm the meter's settings. This chapter provides instructions for entering registration information, as well as setting the meter's volume, display contrast and brightness, time limits for power-saving features, and date and time.

- **Chapter 3: Setting Up a Job**, starting on page 30.

  Before you perform tasks for an installation using the AIM, you can set up the information for the job. This chapter provides instructions for entering the account number, selecting the ODU type, selecting the switch type, and entering the zip code.

- **Chapter 4: Installing an ODU**, starting on page 37.

  The AIM guides you through the steps for aligning and performing follow-up Extended Installation Verification (EIV) for each ODU. This chapter provides instructions for how to complete these processes using the AIM.

- **Chapter 5: Performing EIV**, starting on page 47.

  You can perform Extended Installation Verification (EIV) at selected points in the distribution network to quickly confirm that the installation is satisfactory for all supported orbital slots. EIV is an easy way to pinpoint any potential problems with the installation. This chapter provides instructions for performing EIV at the ODU and other locations in the distribution network.

- **Chapter 6: Performing Other Network Tests**, starting on page 50.

  If there is a problem with a DIRECTV installation, you can run network tests to help you troubleshoot the problem. This chapter provides instructions for performing tests including the In-line test, Satellite Tune test, SWiM LF Power test, Cable Resistance test, and Transponder Survey.

- **Chapter 7: Managing Records**, starting on page 65.

  The AIM stores information for each account, including setup information and test results. This chapter provides instructions for how to view records, delete records, and transfer records to or from the AIM using a USB flash drive.

- **Chapter 8: Updating the Meter**, starting on page 77.

  You can update the AIM as new features become available. This chapter provides instructions for updating the meter's firmware.

## Conventions

The following conventions are used in this manual to help guide you through the features of the AIM:

- Each screen is referenced by the name that appears in the title bar.
- Words that appear on the screen (titles, on-screen options and softkey labels) are shown in **bold**.
- The instructions describe how to navigate through the AIM's features using the meter's softkey buttons. However, you also can use other meter buttons for navigation (including the arrow buttons, alphanumeric buttons, and OK button). For more information, see page 9.
- To make instructions easy to read, buttons are referenced only by their label. For example:

  Press **NEXT** to continue.

Figure 1 Front View

# Getting To Know Your Meter

## Features

Your AIM has the following features:

**Connectors**

**1** IRD F connector

**2** ODU F connector

**3** Type A USB connector (Standard)

**4** Type B USB connector (Mini)

**5** Power input

**Buttons**

**6** Softkeys

**7** Navigation keypad

**8** Alphanumeric keypad

**9** Operation buttons

**10** Power

**Other**

**11** LCD display

Figure 2 Back View

**12** Speaker

**13** Meter serial number

Figure 3 Meter Accessories

## Accessories

Your AIM comes with the following accessories. If any of the following items are missing, contact your supplier.

**1** Carrying case (with shoulder strap and detachable storage pocket)

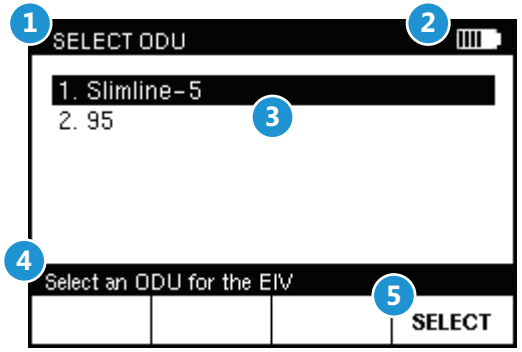
**2** 100 – 240 VAC power adapter

**3** 12 VDC vehicle power adapter

**4** 25 Ω Cable Test Load

**5** 512 MB USB flash drive (containing *AIM User's Manual*)

Figure 4 Meter Display




## Display

The AIM has a large LCD display with a backlight for easy readability. Each screen that appears on the display has the following:

1 **Title bar:** Indicates the screen that is displayed.

2 **Battery icon:** Indicates the power level of the battery.

3 **Main area:** Shows information about the task being performed.

4 **Message bar:** Provides: (a) instructions to guide you through the task being performed; or, (b) status messages.

5 **Softkey labels:** Indicate options that vary based on the screen shown. To select an option, press the button below that option.

## Buttons

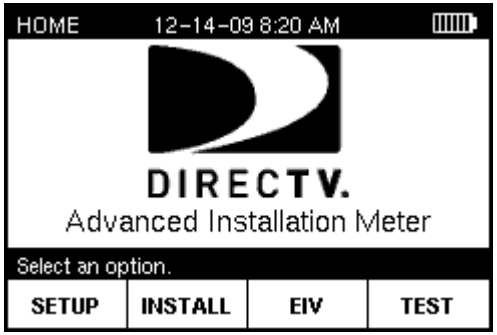
The following buttons let you interact with the meter:

- **4 softkeys:** Select options that correspond to the on-screen labels above the buttons.
- **4 arrows:** Let you navigate up and down to select an option in a list, as well as right or left when entering information.
- **OK:** Selects the option highlighted on the screen.
- **10 alphanumeric buttons:** Let you enter information or select an option in a list.
- **Back:** Lets you go back to the previous screen.
- **Fn:** Lets you quickly change the display contrast, display brightness, and volume.
- **CONFIG:** Lets you view, delete and transfer records, change meter settings, and upgrade the meter's firmware. (For more, see page 21, page 65, and page 77.)
- **HOME:** Displays the HOME screen. (For more, see page 10.)
- **HELP:** Displays instructions to help you complete the task being performed.
- **MUTE:** Turns on and off the sound on the meter.

## Navigation

Keep in mind the following guidelines when using the meter buttons to navigate through the AIM's features:

- *To select a softkey option*, press the button below that option.
- *To highlight an option in a list*, do one of the following:
  - Use the arrow buttons to highlight the option.
  - Use the alphanumeric keypad to enter the number for the option.
- *To select a highlighted option in a list*, do one of the following:
  - Press the **NEXT** or **SELECT** softkey (based on the screen)
  - Press the **OK** button.
- *To return to the **HOME** screen*, do one of the following:
  - Press the **DONE** softkey (if available)
  - Press the **HOME** button.
- *To return to the previous screen*, do one of the following:
  - Press the **BACK** softkey (if available)
  - Press the **BACK** button.




### HOME Screen

The HOME screen lets you access the AIM's main features. You can press the **HOME** button at any time to access the **HOME** screen.

The HOME screen provides four softkeys that correspond to each of the main features of the AIM:

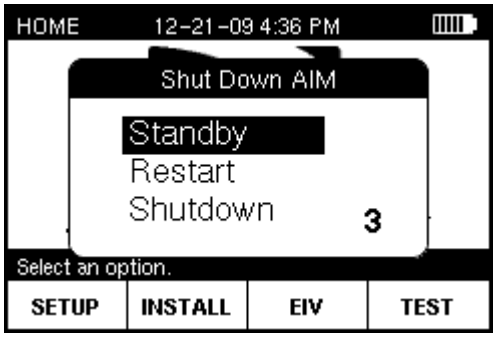
- **SETUP**: Lets you set up the information for a job. See "Setting Up a Job" on page 30.
- **INSTALL**: Guides you through the steps for aligning and performing follow-up Extended Installation Verification (EIV) for each ODU. See "Installing an ODU" on page 37.
- **EIV**: Guides you through the steps for performing Extended Installation Verification (EIV) at the ODU or another location to help you troubleshoot a problem. See "Performing EIV" on page 47.
- **TEST**: Lets you run network tests to help you troubleshoot a problem with an installation. See "Performing Other Network Tests" on page 50.

## Powering Your Meter

### Power-On

To turn on the AIM, press and hold the **POWER** button until the backlight turns on. The meter turns on, briefly displays a splash screen, and then displays the **HOME** screen.

To start a job, press **SETUP** and follow the instructions in "Starting a Job" on page 31.




**Tip:** You have 3 seconds to make a selection on the **SHUT DOWN AIM** screen before the meter automatically turns off.

## Standby Mode

You can place your AIM in a power-saving state called **Standby** mode. Standby mode lets you turn off the AIM display and other features to extend the charge of the battery. You can quickly exit Standby mode and resume working on the screen where you left off.

To enter Standby mode:

1 Press and hold the **POWER** button until the **SHUT DOWN AIM** screen appears.

2 Use ▲ or ▼ to highlight **Standby** and press **OK**.

The meter enters Standby mode.

To exit Standby mode:

Press the **POWER** button.

## Restart

To restart the AIM:

1 Press and hold the **POWER** button until the **SHUT DOWN AIM** screen appears.

2 Use ▲ or ▼ to highlight **Restart** and press **OK**.

The meter turns off, and then automatically turns back on.

## Power-Off

To turn off the AIM:

1 Press and hold the **POWER** button until the **SHUT DOWN AIM** screen appears.

2 Use ▲ or ▼ to highlight **Shutdown** and press **OK**.

The meter turns off.

**Note:** If you are using your AIM for the first time, you should fully charge the battery before use. See "Battery Charging" on page 13.

## Power Management

Your AIM is powered by an 8-cell 9.6 V 3.8 AH NiMH battery pack. The battery supplies power to the meter, as well as to the LNB and SWiM during installation of an ODU. When fully charged, the AIM's battery provides sufficient power to install satellite receiver systems in approximately six single-family homes on a single charge.

The AIM has the following power-saving features that help to extend the battery charge:

- *If no buttons have been pressed on the AIM for **2 minutes***, the **backlight** on the display turns off. The backlight automatically turns back on when you press any button on the meter.
- *If no buttons on the AIM have been pressed for **10 minutes***, the meter enters a power-saving mode called **Standby**. The AIM automatically exits Standby mode when you press and hold the **POWER** button until the backlight turns on.
- *If no buttons on the AIM have been pressed for **30 minutes***, the meter automatically **turns off**. To turn the meter on, press and hold the **POWER** button until the backlight turns on.

You can customize the time periods for each of the power-saving features on the AIM (see "Setting Up the Meter" on page 21). However, extending the time period longer than the default setting shortens the time that the battery charge lasts.

## Battery Charging

You can charge the AIM's battery from a power outlet using the AC power adapter provided with the meter. You also can charge the AIM in your vehicle while the vehicle is running using the vehicle power adapter. The AIM can be charged while it is powered off or while it is powered on, which allows you to use the AIM while it is charging.

The battery icon in the top right of the AIM display indicates the power level of the battery. The AIM should be charged before the battery icon shows only one remaining bar of power. If the remaining bar flashes, the AIM should be charged immediately.

***Caution:*** *When charging the meter battery, make sure that the ambient temperature is between 40°F (5°C) and 100°F (37°C) to prevent damage to the battery.*

You should fully charge the AIM's battery before you use it for the first time. To charge the battery:

1. Plug the AC power adapter into a power outlet, or plug the vehicle power adapter into a 12 VDC socket, such as a cigarette lighter socket.
2. Plug the other end of the power adapter into the AIM's power input connector.

   The charging process begins. A plug icon appears at the top of the display and the bars in the battery icon sequentially flash to show that the meter is charging. (If the meter is off, a battery icon appears on the display.)

   ***Caution:*** *Use only the AC power adapter or vehicle power adapter provided with the meter to charge the meter battery.*
3. When the charging process is complete, the display shows a filled battery icon.

   Unplug the power adapter from the AIM's charging connector. Then unplug the other end from the power outlet or 12 VDC socket.

**Note:** It normally takes approximately 4 hours to fully charge the AIM if its battery is depleted.

## Battery Replacement

If necessary, you can replace the AIM's battery. To obtain a new battery, contact Trilithic. See "Spare Parts List" on page 20.

You also can return your AIM to Trilithic Customer Service and request that the battery be replaced. See "Return Policy" on page v.

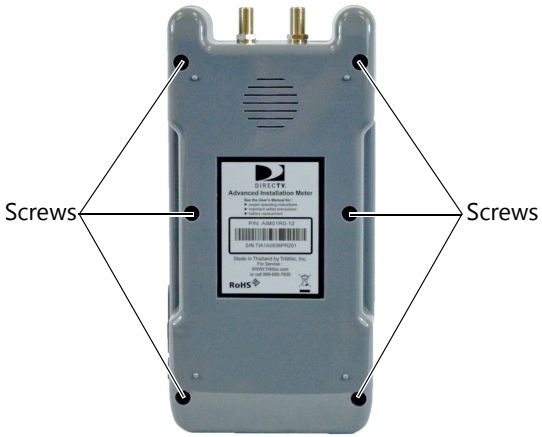
***Caution:*** *ESD (electro-static discharge) can damage the meter. When removing and replacing the battery, observe proper ESD precautions to avoid static discharge. We recommend performing this procedure at a functional ESD workstation. Avoid touching the meter's circuit board during the procedure.*

***Important:*** *Make sure the AIM is turned off and is not connected to a power source before you remove and replace the battery.*

To remove the battery:

**1** Using a Phillips-head screwdriver, remove the 6 screws from the back housing of the AIM. See Figure 5.

Figure 5 Removing the Back Housing Screws




**Tip:** We recommend using a power Phillips screwdriver that can provide 6 to 9 in-lbs of torque.

Figure 6 Removing the Battery Cover

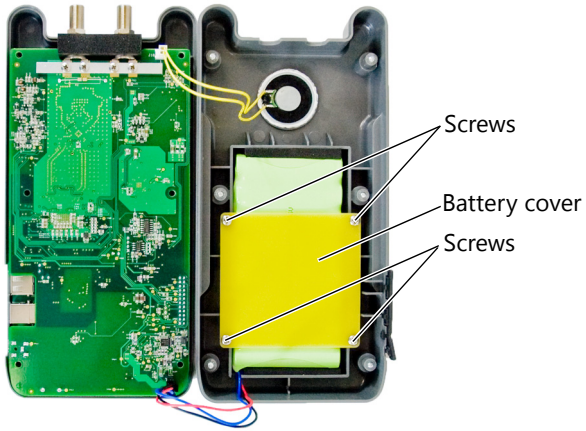
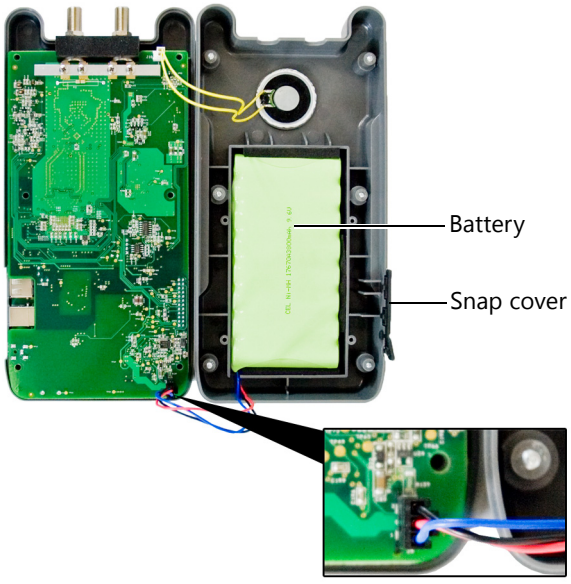



Figure 7 Removing the Battery




2 Carefully separate the front housing and the back housing, and place the unit on a flat work surface.

3 Using the Phillips-head screwdriver, remove the 4 screws on the battery cover and remove the cover. See Figure 6.

4 Disconnect the battery connector from the circuit board. See Figure 7.

5 Remove the battery from the back housing.

To replace the battery:

1. Place the new battery in the compartment in the AIM back housing with the battery wires routed as shown in Figure 7.
2. Reconnect the battery connector to the circuit board.
3. Replace the battery cover and 4 screws. Use the Phillips-head screwdriver to tighten the 4 screws. See Figure 6.
4. If the snap cover for the power input and USB connectors was dislodged during the process, replace it by inserting it in the slot as shown in Figure 7.
5. Place the back housing on top of the front housing. Make sure that the battery wires are tucked into the opening at the bottom of the back housing and are not pinched between the housings.
6. Use the Phillips-head screwdriver to reinstall the 6 screws securing the back housing to the front housing. See Figure 5.
7. To confirm that the battery has been installed correctly, press and hold the Power button to make sure that the AIM turns on.
8. Follow local guidelines for battery disposal.

**Note:** We recommend using a torque setting of 6 to 9 in-lbs to tighten the back housing screws in order to provide a seal that protects the electronics from environmental conditions.

## Getting Technical Support

When you need instructions for using the AIM, your first resource for help is this manual. If you cannot find the information you need, you can:

- Go to the DIRECTV Satellite Installer website or other websites provided by DIRECTV. DIRECTV websites contain product specifications and information, tips, release information, marketing information, Frequently Asked Questions (FAQs), bulletins and other technical information. You can also check these websites for product updates.
- Contact Trilithic technical support. Technical support is available Monday through Friday from 8:00 am to 5:00 pm EST at 1-317-895-3600 or 1-800-344-2412 (toll free). You can also e-mail technical support at techsupport@trilithic.com.

  For a quicker support response when calling or sending e-mail, provide the following information:

  – your name and company name
  – the technical point of contact (name, phone number, e-mail)
  – the AIM serial number, firmware and hardware version numbers
  – a detailed description of the problem you are having, including any error or information messages

## Safety Instructions

When operating and maintaining the AIM meter, basic safety precautions should always be followed to reduce the risk of electric shock and injury to persons, including the following:

- **Warning!** The AIM meter is capable of generating 21 volts. Never connect the AIM to devices that may be damaged by application of AC or DC voltage.
- Thoroughly read this User's Manual before using the meter.
- Thoroughly read this User's Manual before attempting to replace the battery.
- Do not disassemble the meter, unless you are replacing the battery. Disassembling the meter could produce an electric shock.
- Do not place the strap of the carrying case over your neck or otherwise attach it to your person, as this could result in severe injury.
- Do not expose the meter to rain or moisture. Avoid using the meter in severe weather conditions.
- Use only the battery, AC power adapter, and vehicle power adapter provided by Trilithic. Using substitute batteries or power adapters voids the warranty and could produce an electrical shock.
- Never attempt to repair or refurbish the battery. Dispose of the battery properly.
- Refer to this User's Manual for instructions on making connections to the ODU and IRD F connectors.

# Technical Specifications

| | |
|---|---|
| Frequency Range | 250 MHz to 2150 MHz |
| Signal Level Range | -10 dbm to -69 dbm |
| RF Input Connector | Replaceable F-Type (2) |
| Input Impedance | 75 ohm |
| Measurements | Refer to the instructions in this manual. |
| LNB Power Supply | 13 volts / 18 volts |
| SWiM Power Supply | 21 volts |
| Communications | USB flash drive (Linux format only) |
| Battery | 8-cell 9.6 Volt 3.8 AH Rechargeable NiMH |
| Operating Temperature | -25°F to 125°F (-29°C to 52°C) |
| Storage Temperature | -40°F to 150°F (-40°C to 65°C) |
| Battery Charging Temperature | 40°F to 100°F (5°C to 37°C) |
| Display | 240 × 160 pixel backlit LCD |
| Weight | 2 lbs, 8.6 oz (1150 g) |
| Dimensions | 9.6" × 4.6" × 2.3"<br>(244.4 mm × 118 mm × 58.7 mm) |

## Spare Parts List

You can order the following parts for the AIM. Contact Trilithic at 888-895-7630 and request the corresponding part number below:

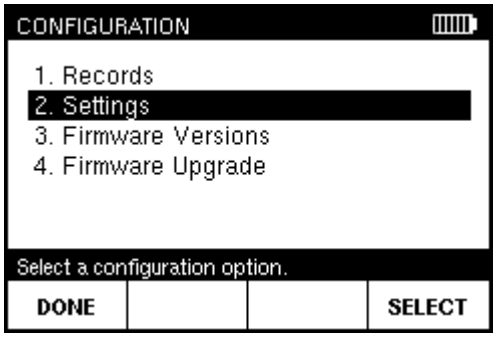
- 100 – 240 VAC power adapter: **0610177000**
- 12 VDC vehicle power adapter: **2072097000**
- Battery pack: **0090056000**
- 25 Ω Cable Test Load: **2011379000**
- F connector: **0200690000**
- Carrying case: **2131417000**

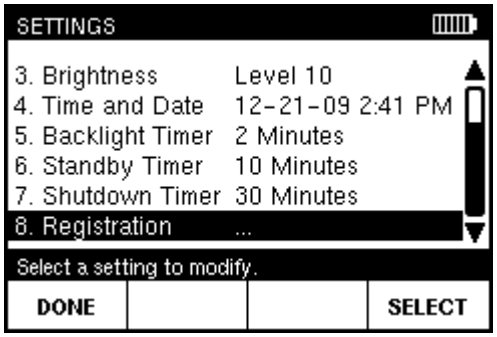
# 2 Setting Up the Meter

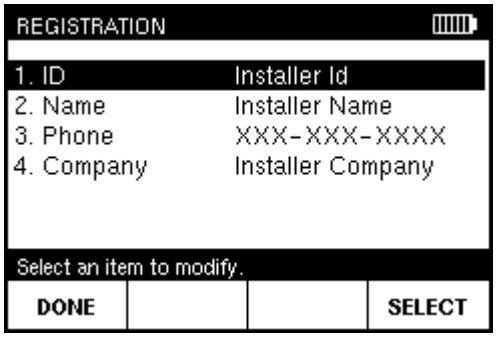
Before you use your AIM, you should enter registration information, including your ID, name, phone number, and company (see page 22). You also should review the meter's settings. You can change the following settings:

- volume (see page 24)
- display contrast and brightness (see page 25)
- time and date, including format (see page 26)
- time limits for automatically turning off the display backlight, entering Standby mode, and turning off the meter (see page 28).

**Tip:** To quickly adjust the setting for display contrast, display brightness, or volume, you can press **Fn** from any screen. On the **UTILITIES** window, use ▲ or ▼ to highlight the setting you want to change, then use ◄ or ► to select the new level. Press **Fn** to exit.




## Entering Registration Information

Before you use your AIM, you should enter registration information in the meter, including your name, ID, phone number, and company.

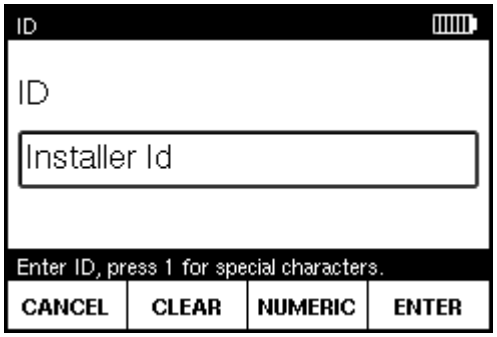
To enter registration information:

1 Press **CONFIG** to go to the **CONFIGURATION** screen.

2 Use ▲ or ▼ to highlight **Settings** and press **SELECT** to go to the **SETTINGS** screen.

3 Use ▲ or ▼ to highlight **Registration** and press **SELECT** to go to the **REGISTRATION** screen.

4 Use ▲ or ▼ to highlight the item you want to enter (**ID**, **Name**, **Phone**, or **Company**). Then press **SELECT** to go to the entry screen.




**Note:** To delete a character, press the **Back** button. You also can use ◄ or ► to navigate within your entry, or press **CLEAR** to delete the entry and start over. Press **CANCEL** to exit without saving changes.

**Tip:** To enter only numbers, press **NUMERIC**. To enter letters and numbers, press **ALPHA**. To enter capital letters, continue pressing the letter button until the capital letter appears.

**Tip:** To enter a space or a special character (such as -, #, &, or +), press the "1" button repeatedly until the space or character you want to enter appears.

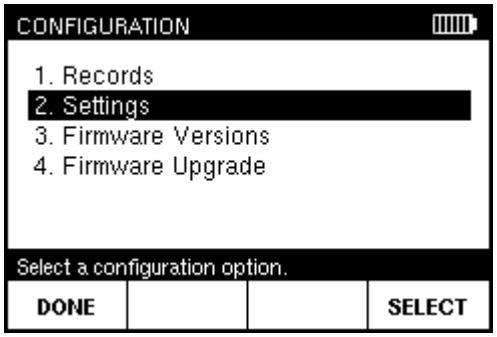
5 Use the alphanumeric keypad to enter the ID, name, phone number or company.

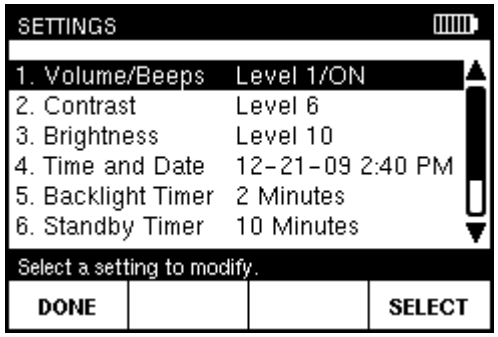
6 Press **ENTER** to save and return to the **REGISTRATION** screen.

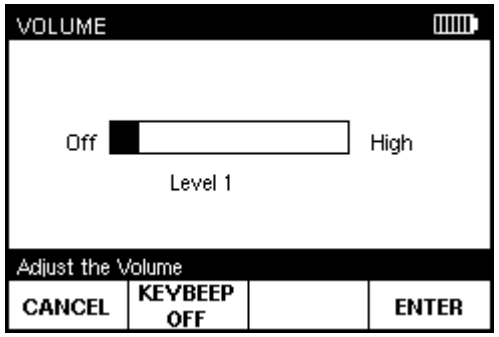
7 Repeat Step 4 through Step 6 for each item on the **REGISTRATION** screen.

8 When you have finished entering registration information, press **DONE** to return to the **SETTINGS** screen.

**Tip:** You can temporarily turn on or turn off the meter sound by pressing **MUTE**. You also can press **Fn** to quickly adjust the volume setting.




## Changing Volume Setting

You can change the volume setting for your AIM.

To change the volume settings:

1 Press **CONFIG** to go to the **CONFIGURATION** screen.

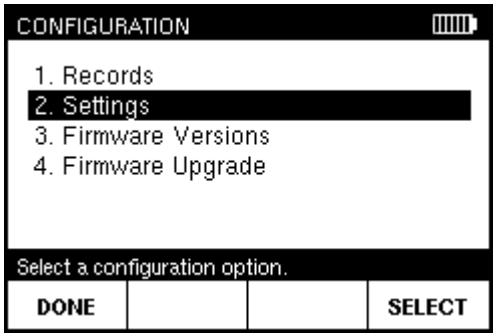
2 Use ▲ or ▼ to highlight **Settings** and press **SELECT** to go to the **SETTINGS** screen, which shows the current settings for the meter.

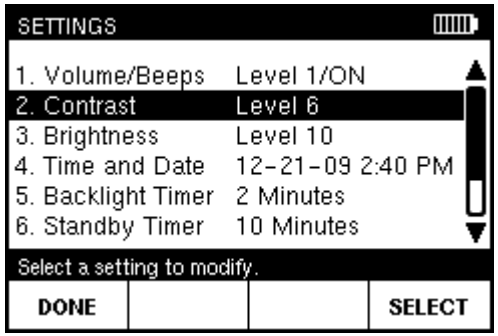
3 Use ▲ or ▼ to highlight **Volume** and press **SELECT** to go to the **VOLUME** screen.

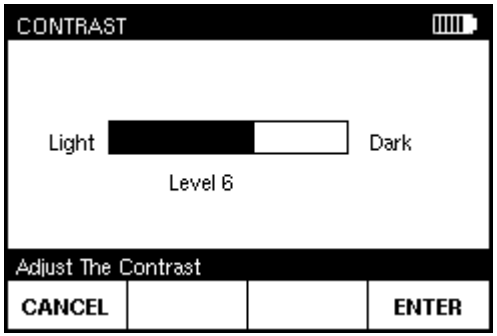
4 Use ◄ or ► to select the desired volume setting. To turn on or off the tone that sounds each time a key is pressed, press **KEYBEEP ON** / **OFF**.

5 Press **ENTER** to return to the **SETTINGS** screen.

**Tip:** You can press **Fn** to quickly adjust the display contrast or display brightness settings.




## Changing the Display Contrast or Brightness

You can change the display contrast and display brightness settings for your AIM.

To change the display contrast or brightness:

1 Press **CONFIG** to go to the **CONFIGURATION** screen.

2 Use ▲ or ▼ to highlight **Settings** and press **SELECT** to go to the **SETTINGS** screen, which shows the current settings for the meter.

3 Use ▲ or ▼ to highlight **Contrast** or **Brightness** and press **SELECT** to go to the **CONTRAST** or **BRIGHTNESS** screen.

4 Use ◄ or ► to select the desired setting. Then press **ENTER** to return to the **SETTINGS** screen.

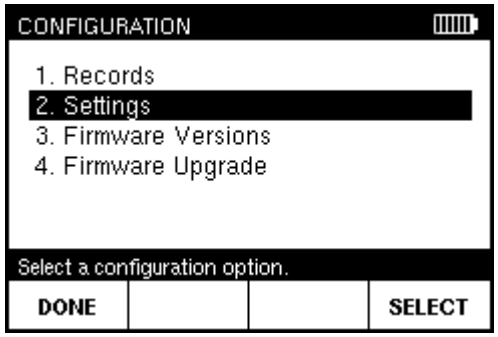
## Changing Time and Date Settings

You can change the time and date settings of your AIM, including the format for the time and date.

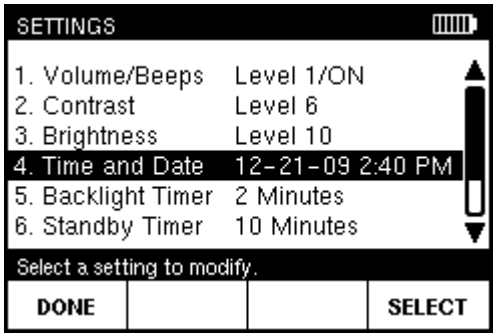
To change the time and date settings:

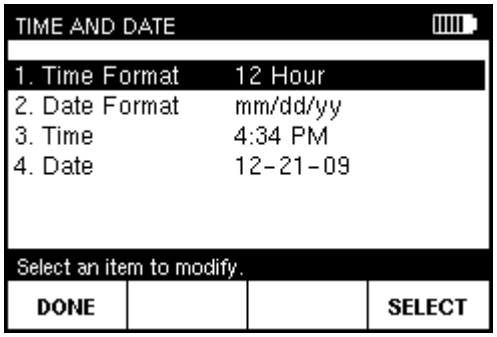
**1** Press **CONFIG** to go to the **CONFIGURATION** screen.

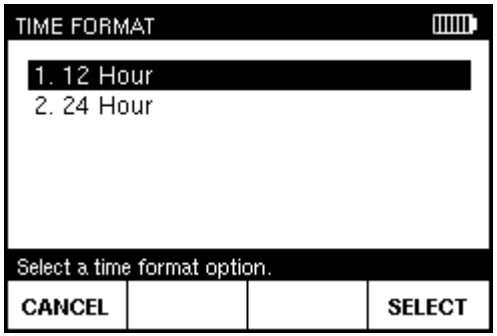
**2** Use ▲ or ▼ to highlight **Settings** and press **SELECT** to go to the **SETTINGS** screen, which shows the current settings for the meter.




**3** Use ▲ or ▼ to highlight **Time and Date** and press **SELECT** to go to the **TIME AND DATE** screen.






**Note:** When entering time or date, you can press the **Back** button to delete a character. You also can use ◄ or ► to navigate within your entry, or press **CLEAR** to delete the entry and start over. Press **CANCEL** to exit without saving changes.

**Tip:** When entering the time, press **AM** or **PM** as appropriate.

4 Use ▲ or ▼ to highlight the item you want to change (**Time Format**, **Date Format**, **Time**, or **Date**). Then press **SELECT** to go to the entry screen.

5 Use ▲ or ▼ to highlight the desired format setting, or use the numeric keypad to enter the time or date. Then press **SELECT** to return to the **TIME AND DATE** screen.

6 When you have finished changing time and date settings, press **DONE** to return to the **SETTINGS** screen.

## Changing Automatic Timer Settings

You can change the automatic timer settings for your AIM, including:

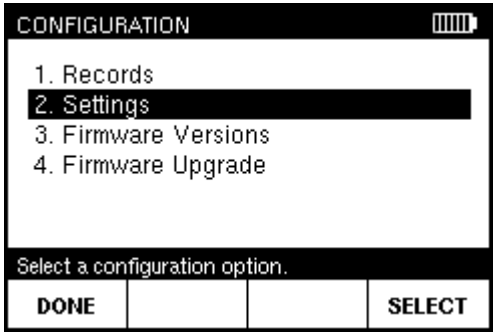
- **Backlight Timer:** If no buttons have been pressed on the AIM after the specified time limit, the backlight on the display turns off. The backlight automatically turns back on when you press any button on the meter.
- **Standby Timer:** If no buttons on the AIM have been pressed after the specified time limit, the meter automatically enters a power-saving mode called Standby. The AIM automatically exits Standby mode when you press and hold the **POWER** button until the backlight turns on.
- **Shutdown Timer:** If no buttons on the AIM have been pressed after the specified time limit, the meter automatically turns off. The meter can be turned back on by pressing and holding the **POWER** button until the backlight turns on.

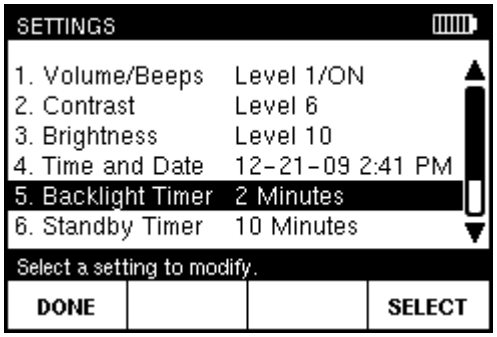
The AIM's automatic timer settings are designed to help extend the battery charge. You can customize the automatic timer settings. However, extending the time period longer than the default setting decreases the time that the battery charge lasts.

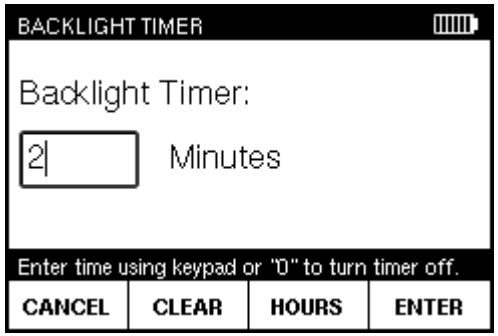
To change automatic timer settings:

**1** Press **CONFIG** to go to the **CONFIGURATION** screen.

**2** Use ▲ or ▼ to highlight **Settings** and press **SELECT** to go to the **SETTINGS** screen, which shows the current settings for the meter.






**Tip:** Press **HOURS**, **MINUTES**, or **SECONDS** to switch between time units. To turn off the timer, enter "0".

**Note:** To delete a character, press the **Back** button. You also can use ◄ or ► to navigate within your entry, or press **CLEAR** to delete the entry and start over. Press **CANCEL** to exit without saving changes.

**3** Use ▲ or ▼ to highlight the automatic timer setting you want to change:

- Highlight **Backlight Timer** to set the time limit for automatically turning off the display backlight after no buttons have been pressed.
- Highlight **Standby Timer** to set the time limit for automatically entering Standby mode after no buttons have been pressed.
- Highlight **Shutdown Timer** to set the timer for automatically turning off the meter after no buttons have been pressed.

**4** Use the numeric keypad to enter a timer setting.

**5** Press **NEXT** to return to the **SETTINGS** screen.

# 3 Setting Up a Job

Before you perform tasks for an installation using the AIM, you need to set up the information for the job. Setup tasks include:

- entering the **account number** (see page 31)
- entering **notes** (optional; see page 33)
- selecting the **ODU type** (see page 34)
- selecting the **switch type** (see page 35)
- entering the **zip code** (see page 36).

## Starting a Job

To start a job, enter the account number for the installation. The AIM stores information about the tasks you perform for the installation in records associated with the account number.

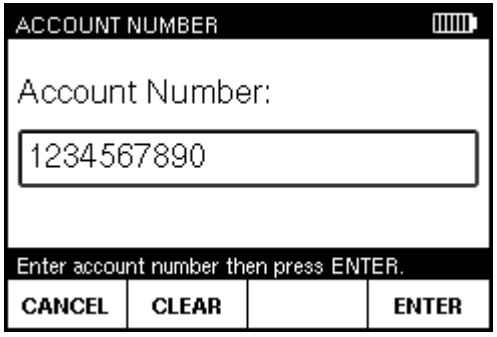
For the first job at an installation, you also set the ODU type, switch type, zip code, and notes either by accepting the default settings (based on the previous job), or by changing the default settings. See "Modifying the Setup for a Job" on page 33.

To start a job:

1 From the **HOME** screen, press **SETUP** to go to the **MODIFY JOB SETUP** screen.

2 Use ▲ or ▼ to highlight **Account #**. Then press **SELECT** to go to the **ACCOUNT NUMBER** screen.

3 Using the numeric keypad, enter the account number for the job. Then press **ENTER**.




**Note:** To delete a character, press **Back**. You also can use ◄ or ► to navigate within your entry, or press **CLEAR** to delete the entry and start over. Press **CANCEL** to exit without saving.

**Tip:** The account number can be up to 22 digits.

**Note:** The default settings are based on the values entered for the previous job.

The **MODIFY JOB SETUP** screen reappears, showing the account number you entered and the default settings for:

- ODU Type
- Notes
- Switch Type
- Zip Code

4 To change the default settings, see "Modifying the Setup for a Job" on page 33.

5 When you have completed the setup information for the job, press **DONE** on the **MODIFY JOB SETUP** screen to return to the **HOME** screen. To install an ODU without returning to the **HOME** screen, press **INSTALL**.

# Modifying the Setup for a Job

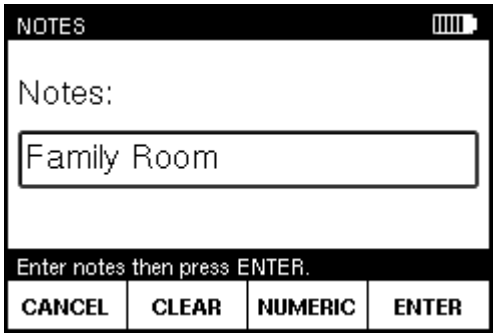
You can change the ODU type, switch type, and zip code settings for a new job or the current job from the **MODIFY JOB SETUP** screen. You also can add notes for the job to include key information about the job, such as the specific room of the installation.

To access the **MODIFY JOB SETUP** screen, press **SETUP** from the **HOME** screen.

## Notes

To change the notes for a job:

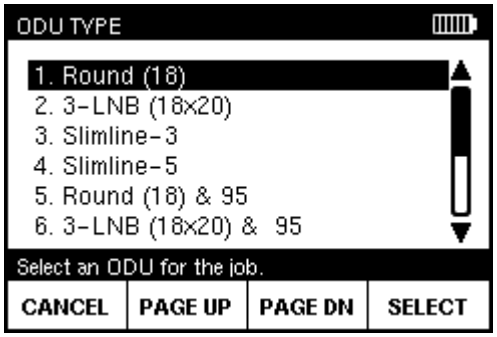
1. On the **MODIFY JOB SETUP** screen, use ▲ or ▼ to highlight **Notes** and press **SELECT** to go to the **NOTES** screen.
2. Using the keypad, enter the notes for the job.
3. Press **ENTER** to return to the **MODIFY JOB SETUP** screen.




**Tip:** To delete a character, press the **Back** button. You also can use ◄ or ► to navigate within your entry, or press **CLEAR** to delete the entry and start over. To exit without saving changes, press **CANCEL**.

**Tip:** To enter only numbers, press **NUMERIC**. To enter letters and numbers, press **ALPHA**. To enter capital letters, continue pressing the letter button until the capital letter appears.

**Tip:** To enter a space or a special character (such as -, #, &, or +), press the "1" button repeatedly until the space or character you want to enter appears.



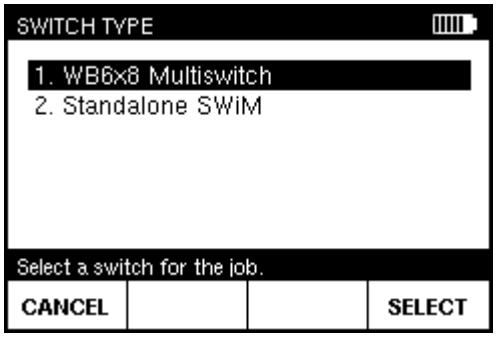

**Tip:** You also can press the number for an option to highlight it.

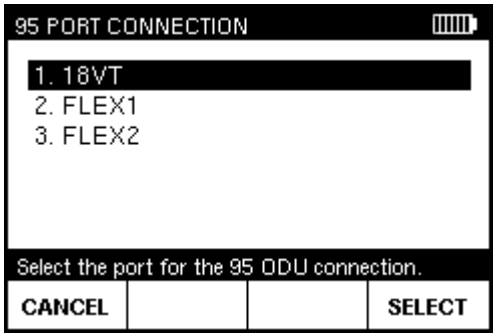
**Tip:** To scroll quickly through the ODU types, press **PAGE UP** or **PAGE DN**. To exit without saving changes, press **CANCEL**.

## ODU Type

To change the ODU type for a job:

1. On the **MODIFY JOB SETUP** screen, use ▲ or ▼ to highlight **ODU Type** and press **SELECT** to go to the **ODU TYPE** screen.
2. Use ▲ or ▼ to highlight the ODU type for the job.
3. Press **SELECT** to return to the **MODIFY JOB SETUP** screen.



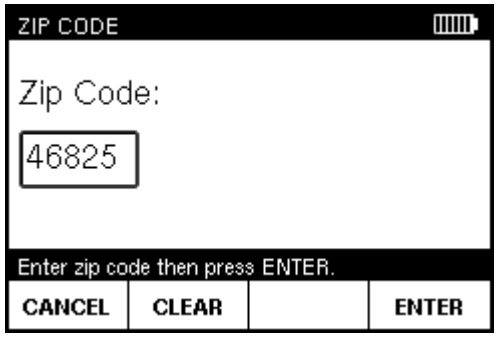




**Tip:** To exit without saving changes, press **CANCEL**.

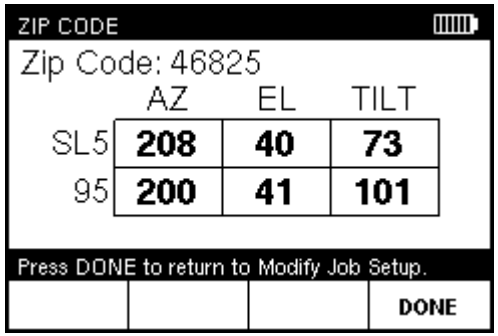
## Switch Type

To change the switch type for a job:

1. On the **MODIFY JOB SETUP** screen, use ▲ or ▼ to highlight **Switch Type** and press **SELECT** to go to the **SWITCH TYPE** screen.
2. Use ▲ or ▼ to highlight the type of switch for the job and press **SELECT**.
3. If the ODU configuration includes a 95° ODU and a 6 x 8 multiswitch or SWiM, the **95 PORT CONNECTION** screen appears. Use ▲ or ▼ to highlight the port to which the 95° ODU is connected.
4. Press **SELECT** to return to the **MODIFY JOB SETUP** screen.




**Tip:** To delete a character, press the **Back** button. You also can use ◄ or ► to navigate within your entry, or press **CLEAR** to delete the entry and start over. To exit without saving changes, press **CANCEL**.




## Zip Code

To change the zip code for a job:

1 On the **MODIFY JOB SETUP** screen, use ▲ or ▼ to highlight **Zip Code** and press **SELECT** to go to the **ZIP CODE** screen.

2 Using the numeric keypad, enter the zip code for the job. Then press **ENTER**.

The default azimuth, elevation and tilt coordinates for the job appear.

3 Press **DONE** to return to the **MODIFY JOB SETUP** screen.

# 4 Installing an ODU

The AIM guides you through the steps for aligning and performing follow-up Extended Installation Verification (EIV) for each ODU.

## Aligning the ODU

The tasks for aligning an ODU vary depending on the type of ODU. All ODU types require coarse adjustments to be made in the azimuth and elevation directions. The 95° ODU also requires an adjustment in the tilt direction. To make coarse adjustments, move the ODU in the appropriate direction and use the AIM to determine the position that obtains the maximum possible signal power.

Slimline ODUs require fine adjustments (dithering) to be performed in the azimuth and elevation directions to further hone the signal power. To dither, rotate the fine adjustment jack screws to:

- obtain a "reference" signal power on one side of the beam peak
- obtain the identical strength on the other side of the beam peak
- split the difference between the two reference points to obtain the obtain the maximum signal power for all applicable orbital slots.

The AIM guides you through the dithering process using a series of audible tones to notify you when the reference values have been obtained.

***Important:*** *The DIRECTV training materials are the primary source of ODU installation instruction. Those documents supersede the instructions in this manual.*

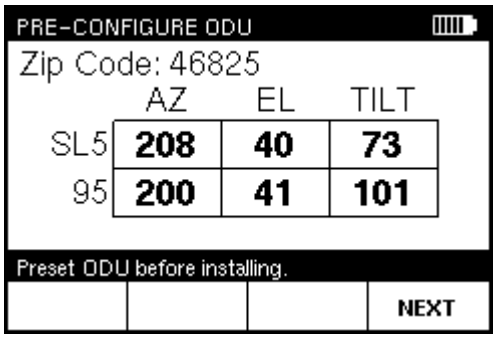
The table below indicates which tasks need to be performed for each ODU. When an installation includes two ODUs, you must perform the installation tasks for each ODU. The AIM Install feature guides you through the tasks based on the selected ODU.

When using the AIM to align an ODU, refer to the appropriate sections for assistance:

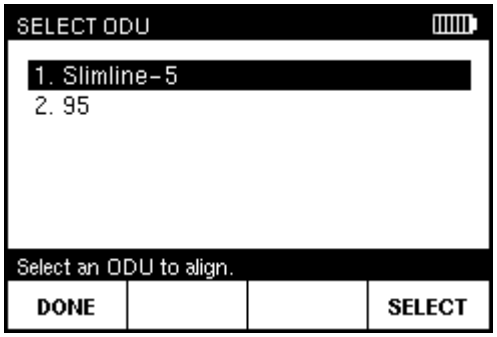
- "Task A. Installation Setup" on page 39
- "Task B. Coarse Azimuth Adjustment" on page 40
- "Task C. Coarse Elevation Adjustment" on page 40
- "Task D. Tilt Adjustment (95°, 3-LNB, Slimline-5, and Slimline-5S (SWiM) ODUs Only)" on page 41
- "Task E. Fine Elevation Adjustment (Slimline ODUs Only)" on page 41
- "Task F. Fine Azimuth Adjustment (Slimline ODUs Only)" on page 43

## ODU Installation Tasks

| ODU | Supported Orbital Slots | Setup | Coarse Azimuth Adjustment | Coarse Elevation Adjustment | Tilt Adjustment | Fine Elevation Adjustment (Dither) | Fine Azimuth Adjustment (Dither) |
|---|---|---|---|---|---|---|---|
| 3-LNB (18" x 20") | 101, 110, 119 | ✓ | ✓ | ✓ | ✓ | | |
| 95° | 95 | ✓ | ✓ | ✓ | ✓ | | |
| Round (18") | 101 | ✓ | ✓ | ✓ | | | |
| Slimline-3 | 99, 101, 103 | ✓ | ✓ | ✓ | | ✓ | ✓ |
| Slimline-5 | 99, 101, 103, 110, 119 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Slimline-3S (SWiM) | 99, 101, 103 | ✓ | ✓ | ✓ | | ✓ | ✓ |
| Slimline-5S (SWiM) | 99, 101, 103, 110, 119 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| World Direct | 95, 101 | ✓ | ✓ | ✓ | ✓ | | |




**Note:** The default coordinates for the job are based on the ODU type and zip code selected for the job.



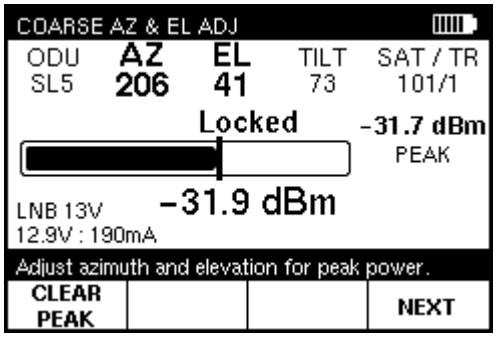

## Task A. Installation Setup

To perform the installation setup:

1. Start the job for the installation ("Starting a Job" on page 31).
2. From the **HOME** screen, press **INSTALL**.

   The **PRE-CONFIGURE ODU** screen appears showing the default azimuth and elevation coordinates for the job. If appropriate, the default tilt coordinate also appears.
3. Perform the ODU site survey. Using the AIM azimuth and elevation coordinates, confirm that the selected location has a clear line-of-sight to the supported orbital slots (see "ODU Installation Tasks" on page 38).
4. Install the ODU according to the DIRECTV procedure.
5. Connect the AIM's ODU F Connector to the ODU's LNB output.
6. Press **NEXT** on the **PRE CONFIGURE ODU** screen.

   *If the installation includes two ODUs,* the **SELECT ODU** screen appears. Use ▲ or ▼ to highlight the ODU to align and press **SELECT** to continue.




**Note:** "Lock" appears on the screen when the signal power is above the minimum level required to supply the IRD.

**Note:** The PEAK measurement is the maximum signal power achieved thus far during the installation process. To clear the peak, press **CLEAR PEAK**.

## Task B. Coarse Azimuth Adjustment

To perform the coarse azimuth adjustment:

1 While monitoring the signal power bar on the **COARSE AZ & EL ADJ** screen, rotate the ODU on the mast in the azimuth direction until the maximum signal power is reached.

2 Lock down the mounting bracket collar on the mast.

## Task C. Coarse Elevation Adjustment

To perform the coarse elevation adjustment:

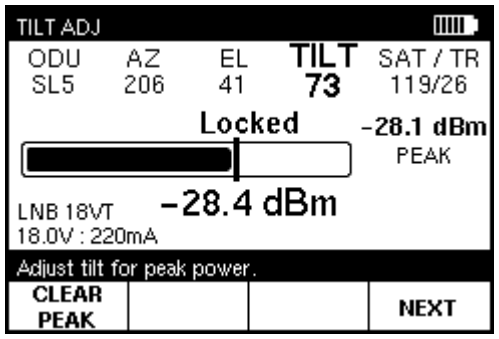
1 Loosen the ODU's elevation lock-down screws.

2 While monitoring the signal power bar on the **COARSE AZ & EL ADJ** screen, rotate the ODU in the elevation direction until the AIM indicates that it is "locked" onto the signal and the maximum signal power is reached.

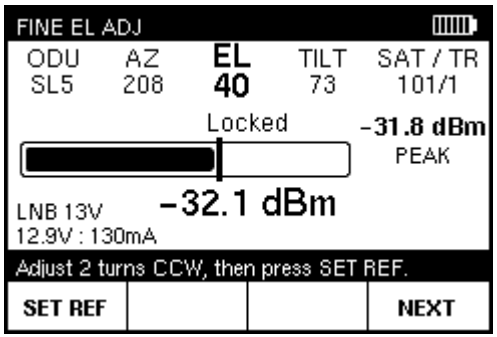
***Important:*** *You might need to alternate between performing the coarse elevation adjustment and the coarse azimuth adjustment to achieve the maximum signal power.*

3 Tighten the elevation lock-down screws.

4 Press **NEXT** to continue.




**Note:** Es/No is a measure of the received carrier strength relative to the strength of the received noise, which is an indication of the quality of the signal.




**Note:** It will take around four turns to reach the reference value.

## Task D. Tilt Adjustment (95°, 3-LNB, Slimline-5, and Slimline-5S (SWiM) ODUs Only)

To perform the tilt adjustment:

1. Loosen the ODU's tilt lock-down screws.
2. While monitoring the Es/No bar on the **TILT ADJ** screen, slowly rotate the ODU around the tilt axis until the maximum Es/No value is reached.
3. Tighten the tilt lock-down screws.
4. Press **NEXT** to continue.

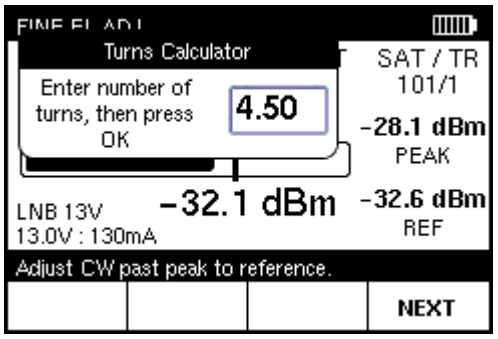
   *For 3-LNB ODUs only*, the **VERIFY AZ & EL** screen appears following the tilt adjustment to ensure the azimuth and elevation are still properly aligned. Adjust the coarse azimuth and elevation if necessary following the steps in "Task B. Coarse Azimuth Adjustment" on page 40 and "Task C. Coarse Elevation Adjustment" on page 40.

## Task E. Fine Elevation Adjustment (Slimline ODUs Only)

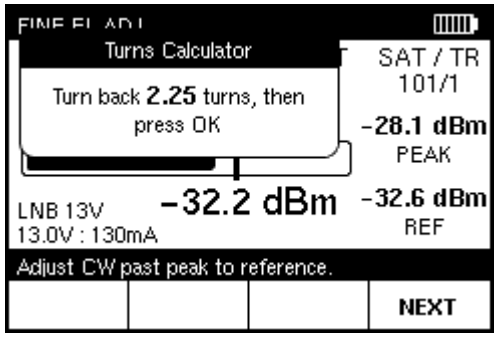
To perform the fine elevation adjustment:

1. Loosen the ODU's elevation lock-down screws.
2. Turn the ODU's elevation jack screw counterclockwise 2 turns.
3. On the **FINE EL ADJ** screen, press **SET REF** to set the reference value.

   The AIM sounds a confirmation tone and displays the reference value.
4. Zero out the readout dial on the elevation jack screw.
5. Turn the elevation jack screw clockwise until the meter sounds a confirmation tone and the displayed signal power matches the reference value.




**Example:** If it took four and a half turns to return to the reference value, enter **4.50**.



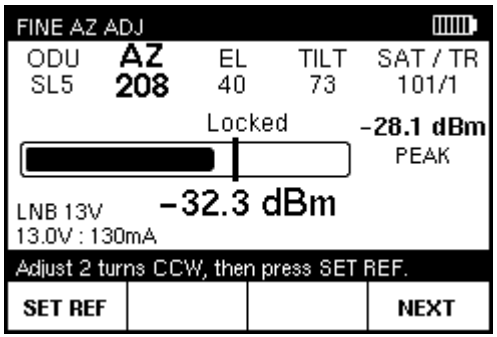

6 Refer to the ODU's dial and use the AIM's numeric keypad to enter the number of turns it took to return to the reference value. Then press **OK**.

7 Zero out the readout dial on the elevation jack screw.

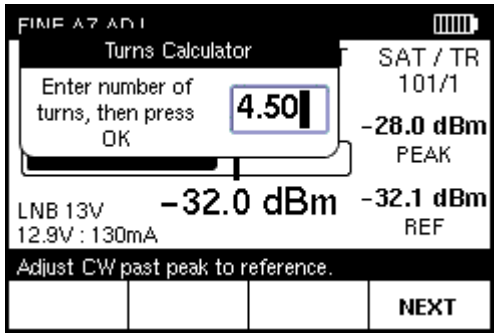
8 Refer to the AIM screen and turn the elevation jack screw counterclockwise the number of turns indicated on the AIM screen.

9 Tighten the elevation lock-down screws.

10 Press **OK** and then **NEXT** to continue.




**Note:** It will take around four turns to reach the reference value.



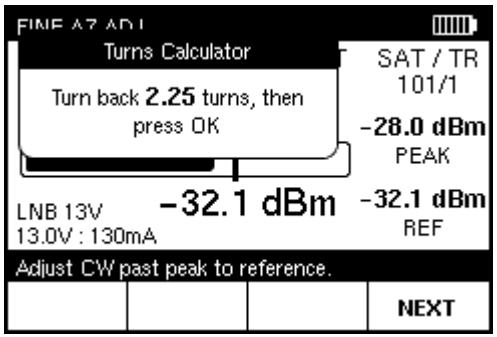

**Example:** If it took four and a half turns to return to the reference value, enter **4.50**.

## Task F. Fine Azimuth Adjustment (Slimline ODUs Only)

To perform the fine azimuth adjustment:

1. Loosen the ODU's azimuth lock-down screws.
2. Turn the ODU's azimuth jack screw counterclockwise 2 turns.
3. On the **FINE AZ ADJ** screen, press **SET REF** to set the reference value.

   The AIM sounds a confirmation tone and displays the reference value.
4. Zero out the readout dial on the azimuth jack screw.
5. Turn the azimuth jack screw clockwise until the meter sounds a confirmation tone and the displayed signal power matches the reference value.
6. Refer to the ODU's dial and use the AIM's numeric keypad to enter the number of turns it took to return to the reference value. Then press **OK**.
7. Zero out the readout dial on the azimuth jack screw.




8 Refer to the AIM screen and turn the azimuth jack screw counterclockwise the number of turns indicated on the AIM screen.

9 Tighten the azimuth lock-down screws.

10 Press **OK** and then **NEXT** to continue.

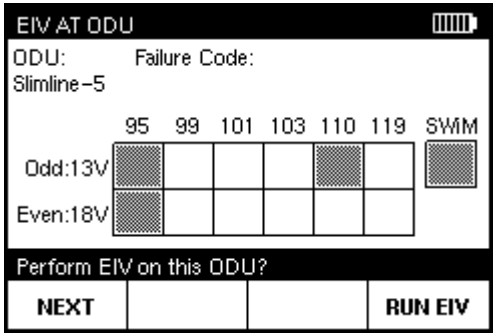
## Performing EIV Following ODU Installation

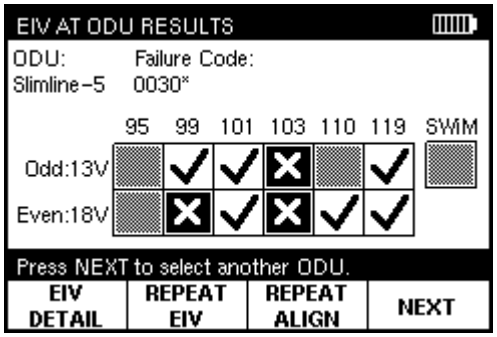
When you complete the alignment process for the ODU, the **EIV AT ODU** screen appears. You can:

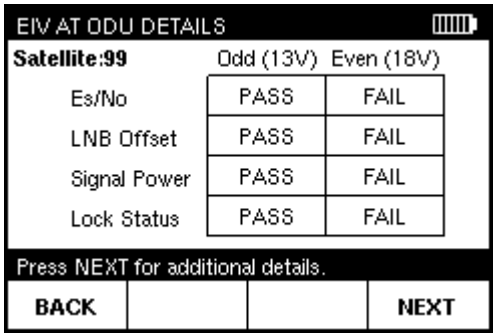
- immediately perform Extended Installation Verification (EIV) on the ODU that you just aligned. Follow the steps below.
- *if the installation includes two ODUs*, you can press **NEXT** to return to the **SELECT ODU** screen and align the other ODU.
- press **DONE** to return to the **HOME** screen and perform EIV later. For instructions, see "Performing EIV" on page 47.

To perform the Extended Installation Verification (EIV) for the ODU that you just aligned:

**1** On the **EIV AT ODU** screen, press **RUN EIV** and wait briefly for the results.






**Note:** On the **EIV AT ODU DETAILS** screen, you can press **NEXT** to view the details for another orbital slot, or press **BACK** to scroll back through the details to the **EIV AT ODU RESULTS** screen.

**2** On the **EIV AT ODU RESULTS** screen, review the results for all supported orbital slots and SWiM channels (if applicable). A satisfactory result is indicated by ✓. A problem is indicated by **X**.

*If ✓ appears for all supported orbital slots*, the ODU alignment is acceptable.

*If **X** appears for an orbital slot*, perform the following steps:

**a** Press **REPEAT EIV** to confirm the problem.

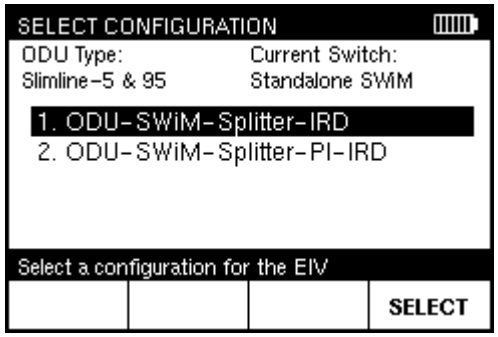
**b** If **X** appears again for one or more orbital slots, you can press **EIV DETAIL** to determine which tests failed. Troubleshoot any failures following the instructions provided by DIRECTV.

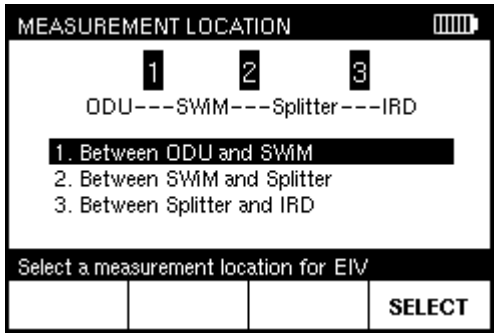
**c** To repeat the alignment process, press **REPEAT ALIGN**.

**3** When you have finished reviewing EIV results on the **EIV AT ODU RESULTS** screen, you can press **DONE** to return to the **HOME** screen.

*If the installation includes two ODUs*, you can press **NEXT** to return to the **SELECT ODU** screen and align the other ODU.

# 5 Performing EIV



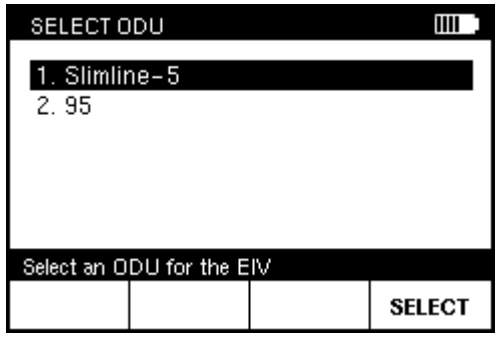




**Example:** To test between the ODU and the multiswitch, disconnect the cable connecting the ODU to the multiswitch and connect it to the AIM's ODU F connector.

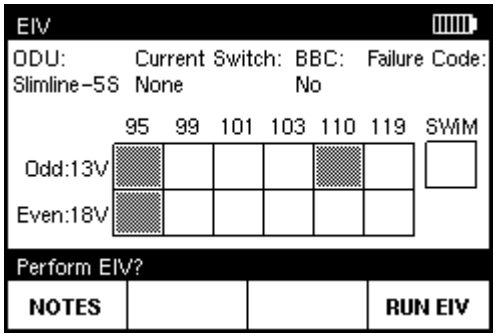
Extended Installation Verification (EIV) can be performed at any point in the installation to quickly confirm that the installation is satisfactory for all supported orbital slots. EIV is an easy way to pinpoint any potential problems with the installation. The AIM guides you through the steps for the testing.

To perform the Extended Installation Verification (EIV):

1. Start the job for the installation ("Starting a Job" on page 31).
2. From the **HOME** screen, press **EIV** to go to the **SELECT CONFIGURATION** screen.
3. Use ▲ or ▼ to highlight the equipment configuration for the installation and press **SELECT** to go to the **MEASUREMENT LOCATION** screen.
4. Use ▲ or ▼ to highlight the location where you are testing.
5. Connect the AIM ODU F connector at the point in the distribution network where you want to test. Then press **SELECT** to go to the **EIV** screen.

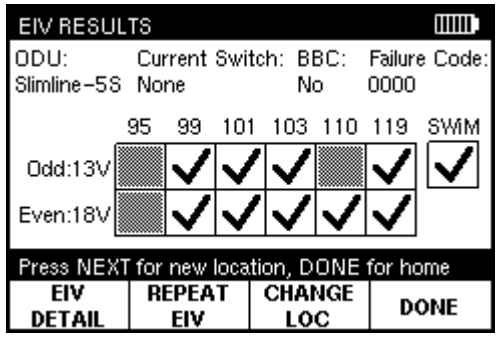



*If the installation includes two ODUs*, the **SELECT ODU** screen appears. Use ▲ or ▼ to highlight the ODU for which you want to perform EIV and press **SELECT** to go to the **EIV** screen.

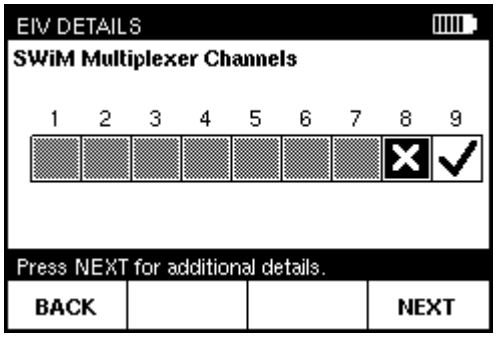



**6** On the **EIV** screen, press **RUN EIV** and wait briefly for the results.

**Note:** To add a note about the EIV, such as details about where the EIV is being performed, press **NOTES**. Then enter the note following the instructions on page 33.




**Note:** To change the location where you are testing, press **CHANGE LOC**.




**Note:** On the **EIV DETAILS** screen, you can press **NEXT** to view the details for another orbital slot, or press **BACK** to scroll back through the details to the **EIV RESULTS** screen.

**7** On the **EIV RESULTS** screen, review the results for all supported orbital slots and SWiM channels (if applicable). A satisfactory result is indicated by ✓. A problem is indicated by **X**.

*If ✓ appears for all supported orbital slots*, the ODU alignment is acceptable.

*If **X** appears for an orbital slot*, perform the following steps:

**a** Press **REPEAT EIV** to confirm the problem.

**b** If **X** appears again for one or more orbital slots, you can press **EIV DETAIL** to determine which tests failed. Troubleshoot any failures following the instructions provided by DIRECTV.

**8** When you have finished reviewing EIV results on the **EIV RESULTS** screen, you can press **DONE** to return to the **HOME** screen.

You also can press **CHANGE LOC** to perform EIV for another location.

# 6 Performing Other Network Tests

If there is a problem with a DIRECTV installation, you can run network tests to help you troubleshoot the problem. These tests include:

- **In-line** test (see page 51)
- **Satellite Tune** test (see page 53)
- **SWiM LF Power** test (see page 57)
- **Cable Resistance** test (see page 59)
- **Transponder Survey** (see page 61)

The AIM guides you through the steps for each test.

## Performing an In-Line Test

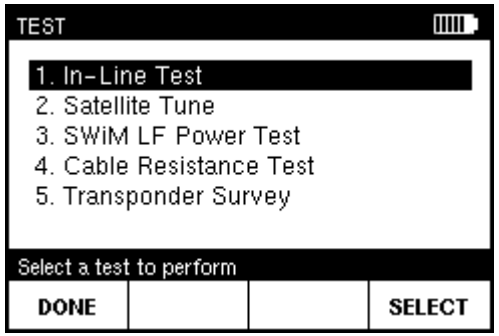
You can use the AIM's In-line test feature to help determine the cause of a problem in an installation. Connecting the AIM in series with the equipment, you can progressively test each segment of the connection between the ODU and the IRD to locate a problem. The AIM can measure the voltage, current, and 22 kHz signals to verify that the correct control signals are being transmitted through the coaxial cable.

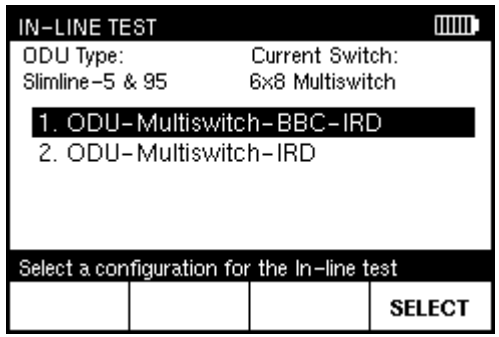
To perform an In-line test:

**1** Start the job for the installation ("Starting a Job" on page 31).

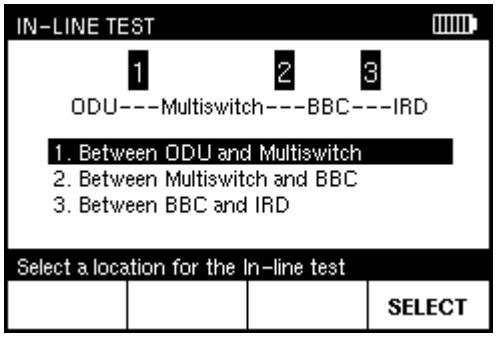
**2** From the **HOME** screen, press **TEST** to go to the **TEST** screen.

**3** Use ▲ or ▼ to highlight **In-Line Test** and press **SELECT** to go to the **IN-LINE TEST** screen.

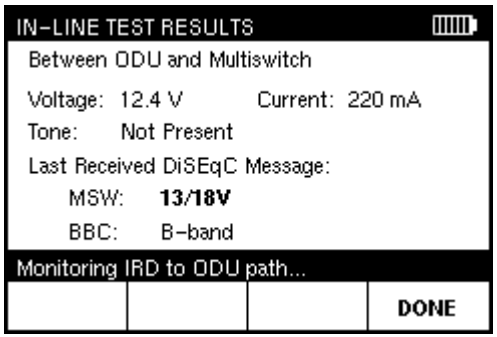



**4** Use ▲ or ▼ to highlight the equipment configuration for the installation and press **SELECT** to continue.




**Example:** To test between the ODU and the multiswitch, disconnect the cable connecting the ODU to the multiswitch and connect it to the AIM's ODU F connector. Then connect the AIM's IRD F connector to the multiswitch.




**Note:** As messages are received from the multiswitch (MSW) and BBC, the multiswitch port and BBC frequency range flash bold. If no messages are received, "N/A" appears.

**5** Use ▲ or ▼ to highlight the location where you are testing.

**6** Connect the AIM in series with the equipment at the location where you want to test.

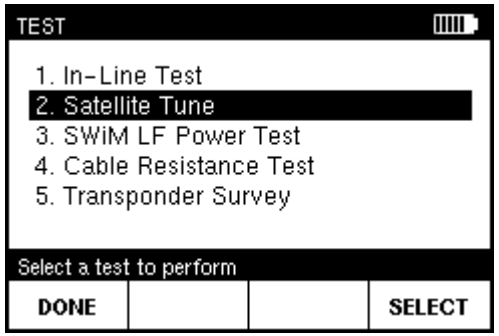
**7** Press **SELECT** and wait briefly for the results of the test.

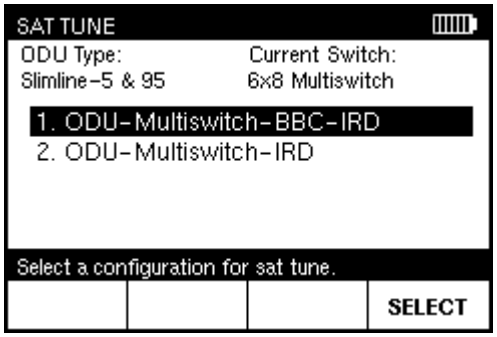
**8** On the **IN-LINE TEST RESULTS** screen, review the results of the test. The screen indicates whether the test passed or failed. The screen also shows:

- **Voltage** supplied (in volts).
- **Current** supplied (in milliamps).
- If present, amplitude of the 22 kHz **tone**.
- Indication as to whether **DiSEqC** commands are being received by the multiswitch (**MSW**) and **BBC**.

**9** Troubleshoot any problems following the instructions provided by DIRECTV.

**10** Press **DONE** to return to the **TEST** screen.



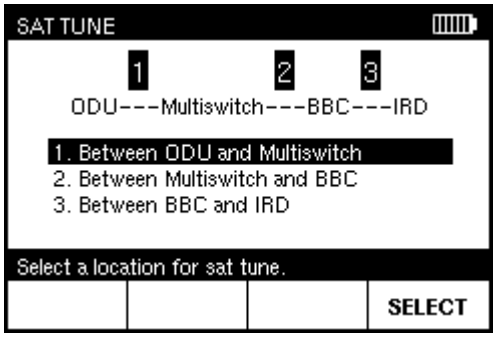




## Performing a Satellite Tune Test

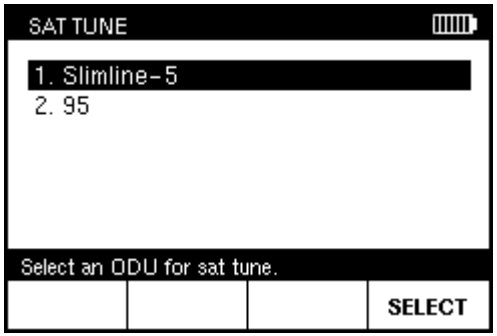
You can use the AIM's Satellite Tune feature to tune to any DIRECTV transponder. Connecting the AIM in different locations in the distribution network, you can progressively test each segment of the connection between the ODU and the IRD to locate a problem.

To perform a Satellite Tune test:

1. Start the job for the installation ("Starting a Job" on page 31).
2. From the **HOME** screen, press **TEST** to go to the **TEST** screen.
3. Use ▲ or ▼ to highlight **Satellite Tune** and press **SELECT** to go to the **SAT TUNE** screen.
4. Use ▲ or ▼ to highlight the equipment configuration for the installation and press **SELECT** to continue.




**Example:** To test between the ODU and the multiswitch, disconnect the cable connecting the ODU to the multiswitch and connect it to the AIM's ODU F connector.

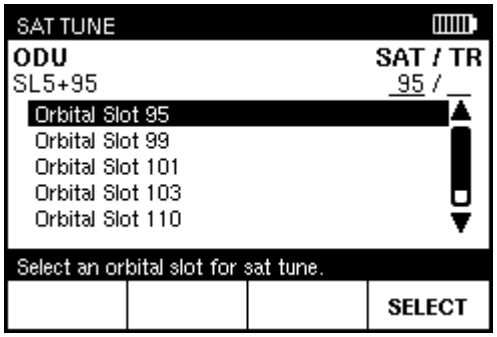



**5** Use ▲ or ▼ to highlight the location where you are testing.

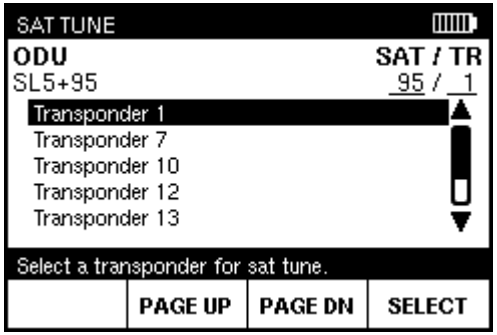
**6** Connect the AIM ODU F connector at the point in the distribution network where you want to test.

**7** Press **SELECT** to continue.

**8** *If the installation includes two ODUs*, use ▲ or ▼ to highlight the ODU to test and press **SELECT** to continue.



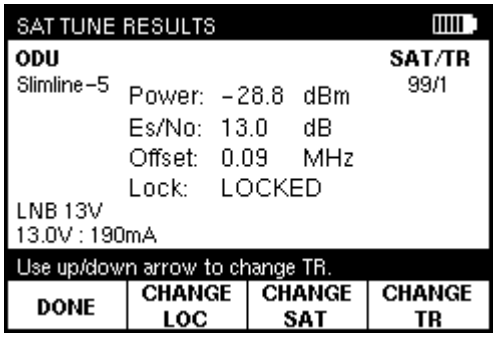

**Note:** You also can use the keypad to enter the orbital slot number.




**Note:** You also can use the keypad to enter the transponder number. Use **PAGE UP** or **PAGE DN** to scroll quickly through the transponders.

**9** Use ▲ or ▼ to highlight the orbital slot to test and press **SELECT** to continue.

**10** Use ▲ or ▼ to highlight the transponder to test. Then press **SELECT** and wait briefly for the results of the test.




**Note:** The **SAT TUNE RESULTS** screen automatically updates to show the most recent test results for the transponder.

**11** On the **SAT TUNE RESULTS** screen, review the results of the test. The screen shows:

- **Power** of the transponder signal (in dBm—power ratio in decibels of the measured power referenced to one milliwatt).
- Measurement of the carrier-to-noise ratio, expressed as **Es/No** in decibels.
- Frequency **offset** of the transponder signal from its expected frequency (in megahertz)
- Indication as to whether the transponder signal is above the power **lock** threshold.

**12** Troubleshoot any problems following the instructions provided by DIRECTV.

**a** *To repeat the test at a different location*, press **CHANGE LOC**. Then go to Step 5.

**b** *To repeat the test at a different orbital slot*, press **CHANGE SAT**. Then go to Step 9.

**c** *To repeat the test at a different transponder*, press **CHANGE TR**. Then go to Step 10.

*To repeat the test for a sequential transponder*, use ▲ or ▼ to change the transponder number to the next or previous transponder. The **SAT TUNE RESULTS** screen updates to show the results of the test for the selected transponder.

**13** Press **DONE** to return to the **TEST** screen.

## Performing a SWiM LF Power Test

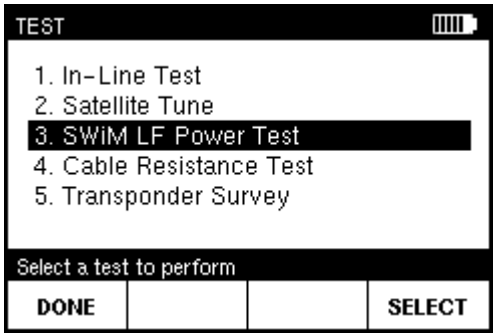
You can use the AIM's SWiM LF Power test feature to determine whether there is a communications problem between the SWiM and the IRD. To perform this test, disconnect all IRDs in the distribution network, then connect the AIM in place of an IRD. The AIM determines whether the SWiM LF Power level is sufficient.

To perform a SWiM LF Power test:

**1** Start the job for the installation ("Starting a Job" on page 31).

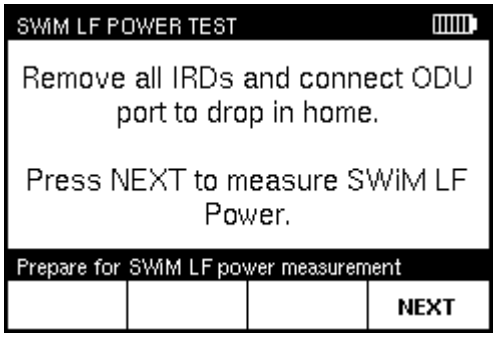
**2** From the **HOME** screen, press **TEST** to go to the **TEST** screen.

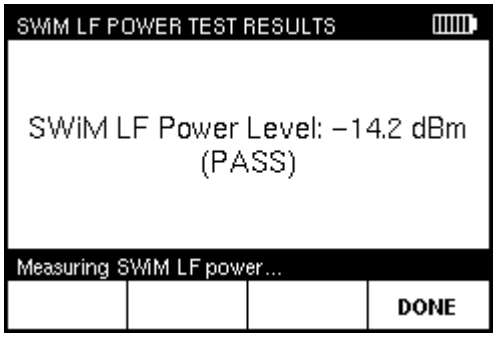
**3** Use ▲ or ▼ to highlight **SWiM LF Power Test** and press **SELECT** to go to the **SWiM LF POWER TEST** screen.




**4** Disconnect all IRDs in the distribution network. Then connect the AIM in place of an IRD.

**5** Press **NEXT** and wait briefly for the results of the test.


SWiM LF POWER TEST
Remove all IRDs and connect ODU port to drop in home.
Press NEXT to measure SWiM LF Power.
Prepare for SWiM LF power measurement
NEXT




**Note:** The **SWiM LF POWER TEST RESULTS** screen automatically updates to show the most recent test results.

6 On the **SWiM LF POWER TEST RESULTS** screen, review the results of the test. The screen shows whether the SWiM LF power level is sufficient.

7 Troubleshoot any problems following the instructions provided by DIRECTV.

To repeat the SWiM LF Power test in case of a failure, press **RETRY**.

8 Press **DONE** to return to the **TEST** screen.

## Performing a Cable Resistance Test

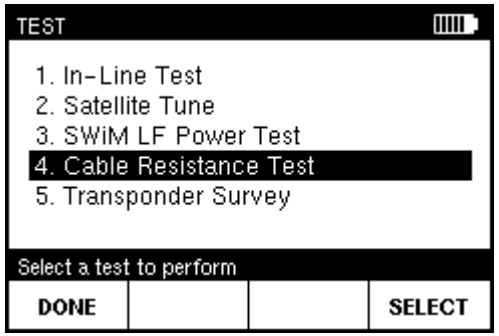
You can use the AIM's Cable Resistance test feature to help determine whether there is a problem with a cable used in the distribution network. To complete this test, you must use the 25 Ω Cable Test Load (provided with the AIM). By placing the Cable Test Load on the end of a cable, you can determine the resistance value for the cable. A high resistance value indicates that the cable may have been inadvertently cut. A low resistance value indicates that the cable may have a short.

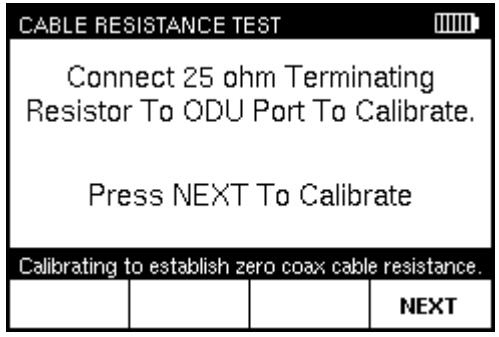
To perform a Cable Resistance test:

**1** Start the job for the installation ("Starting a Job" on page 31).

**2** From the **HOME** screen, press **TEST** to go to the **TEST** screen.

**3** Use ▲ or ▼ to highlight **Cable Resistance Test** and press **SELECT** to go to the **CABLE RESISTANCE TEST** screen.





CABLE RESISTANCE TEST
Connect 25 ohm Terminating Resistor To ODU Port To Calibrate.
Press NEXT To Calibrate
Calibrating to establish zero coax cable resistance.
NEXT

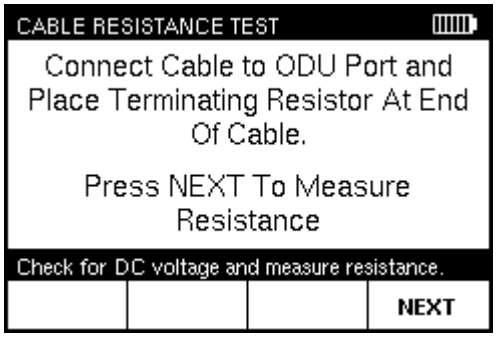
**4** Connect the 25 Ω Cable Test Load to the AIM ODU F connector.

**5** Press **NEXT** to confirm the resistance of the Cable Test Load.

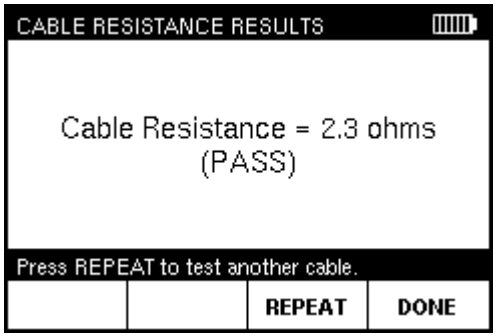
*If the resistance is outside of the allowable range*, a message appears. Perform the following steps:

**a** Press **RE-TEST** to confirm the problem.

**b** If the resistance is still outside of the range, the Cable Test Load has failed. Replace the Cable Test Load and re-start the Cable Resistance test.


CABLE RESISTANCE TEST
Connect Cable to ODU Port and Place Terminating Resistor At End Of Cable.
Press NEXT To Measure Resistance
Check for DC voltage and measure resistance.
NEXT

**Note:** If a message appears stating that DC voltage was detected, the cable is not connected to the Cable Test Load. Make sure you are testing the appropriate cable, then press **NEXT** to continue the test.




6 Connect the Cable Test Load to one end of the cable you want to test. Then connect the other end of the cable to the AIM ODU F connector.

7 Press **NEXT** and wait briefly for the results of the test.

8 On the **CABLE RESISTANCE RESULTS** screen, review the resistance of the cable in ohms, adjusted for the 25 Ω Cable Test Load.

9 Troubleshoot any problems following the instructions provided by DIRECTV.

To repeat the Cable Resistance test, press **REPEAT**.

10 Press **DONE** to return to the **TEST** screen.

## Performing a Transponder Survey

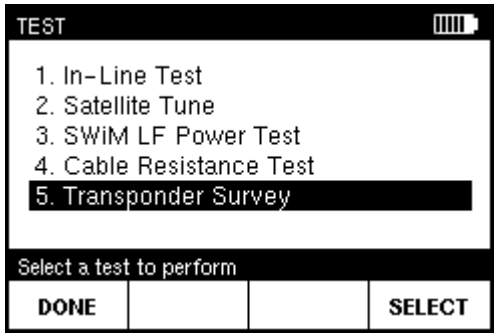
You can use the AIM's Transponder Survey feature to record the signal power, carrier-to-noise ratio (ES/No), frequency offset, and lock status for all transponders that can be received using the selected equipment. This can help to determine the location of a problem for an installation. Connecting the AIM in the distribution network, you can progressively test each segment of the connection between the ODU and the IRD to locate a problem.

To perform a Transponder Survey:

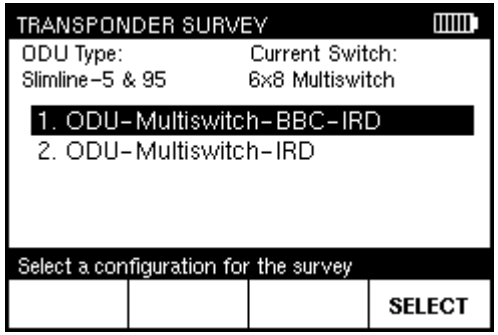
**1** Start the job for the installation ("Starting a Job" on page 31).

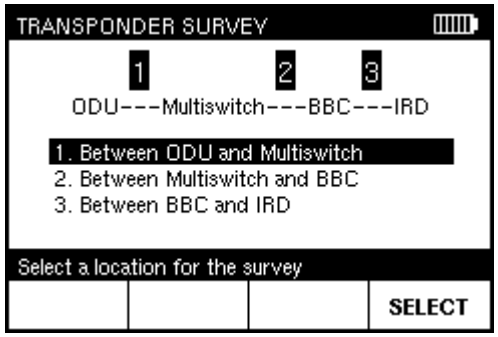
**2** From the **HOME** screen, press **TEST** to go to the **TEST** screen.

**3** Use ▲ or ▼ to highlight **Scan** and press **SELECT** to go to the **TRANSPONDER SURVEY** screen.

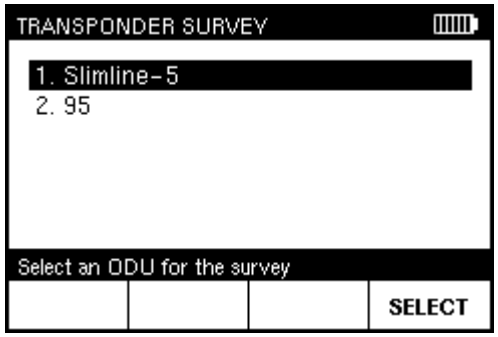



**4** Use ▲ or ▼ to highlight the equipment configuration for the installation and press **SELECT** to continue.






**Example:** To test between the ODU and the multiswitch, disconnect the cable connecting the ODU to the multiswitch and connect it to the AIM's ODU F connector.

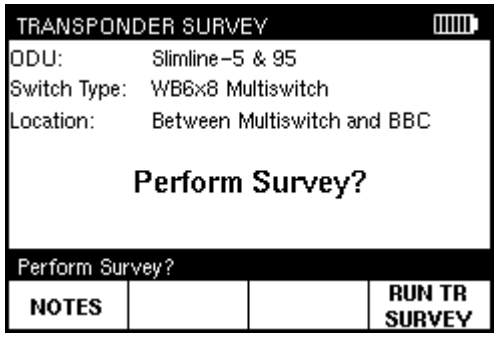



**5** Use ▲ or ▼ to highlight the location where you are testing.

**6** Connect the AIM ODU F connector at the point in the distribution network where you want to test.

**7** Press **SELECT** to continue.

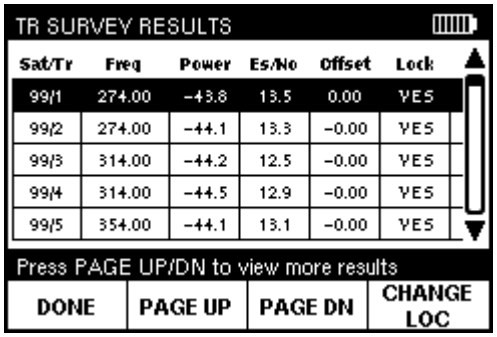
**8** *If the installation includes two ODUs*, use ▲ or ▼ to highlight the ODU to test. Then press **SELECT** to continue.




**Note:** To add a note about the transponder survey, such as details about where the survey is being performed, press **NOTES**. Then enter the note following the instructions on page 33.

**9** Press **RUN TR SURVEY** to start the test. The screen indicates each orbital slot and transponder as they are scanned.

**10** When the scan test is complete, press **VIEW** to go to the **TRANSPONDER SURVEY RESULTS** screen.


TR SURVEY RESULTS
Sat/Tr Freq Power Es/No Offset Lock
99/1 274.00 -43.8 13.5 0.00 YES
99/2 274.00 -44.1 13.3 -0.00 YES
99/3 314.00 -44.2 12.5 -0.00 YES
99/4 314.00 -44.5 12.9 -0.00 YES
99/5 354.00 -44.1 13.1 -0.00 YES
Press PAGE UP/DN to view more results
DONE
PAGE UP
PAGE DN
CHANGE LOC

**Tip:** Use **PAGE UP** and **PAGE DN** to scroll quickly through test results.

**11** Use ▲ or ▼ to review the results of the test. The screen shows the following information for each transponder:

- **Power** of the transponder signal (in dBm—power ratio in decibels of the measured power referenced to one milliwatt).
- Measurement of the carrier-to-noise ratio, expressed as **Es/No** in decibels.
- Frequency **offset** of the transponder signal from its expected frequency (in megahertz)
- Indication whether the transponder signal is above the power **lock** threshold.
- **Voltage** supplied (in volts).
- **Current** supplied (in milliamps).
- **ODU** used.
- **SWiM** channel used.

**12** Troubleshoot any problems following the instructions provided by DIRECTV.

To repeat the test at a different location, press **CHANGE LOC**.

**13** Press **DONE** to return to the **TEST** screen.

# 7 Managing Records

The AIM stores information for each account, including the setup information for the installation, and the results for each EIV and Transponder Survey. For all accounts, you can:

- view records (see page 69)
- delete records (see page 73)
- transfer records to and from a USB flash drive (see page 75).

The AIM can hold up to 100 record files. When there are 100 stored record files and a new file is to be added, the oldest file is deleted.

# Understanding Records

The AIM stores information in different types of records, including:

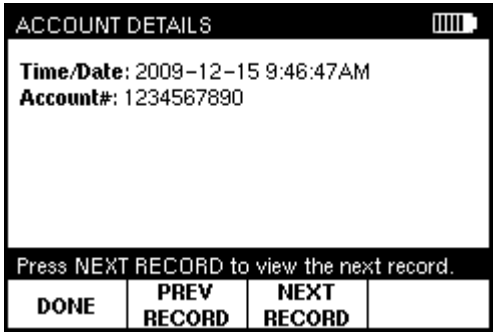
- **account** records (page 66)
- **setup** records (page 67)
- **user** records (page 67)
- **test** records (page 67)
- **data** records (page 68).

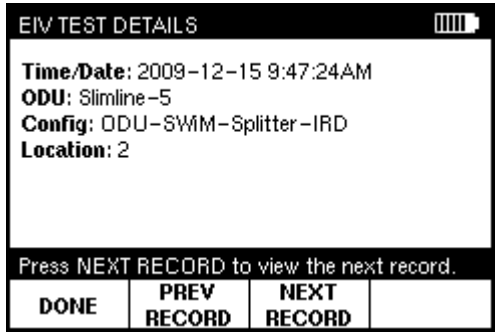
These records are stored in log files and survey files.

- A **log file** contains records of all types. Select a log file to view setup information, as well as results from an EIV or Transponder Survey.
- A **survey file** contains test and data records for a particular Transponder Survey. Select a survey file for quick access to Transponder Survey results.
- An **EIV file** contains test and data records for a particular EIV. Select an EIV file for quick access to EIV results.

## Account Records

An account record is generated each time a new account number is entered or an EIV or Transponder Survey is performed. This record shows the account number, as well as the time and date when the account number was added or the test was performed.






## Setup Records

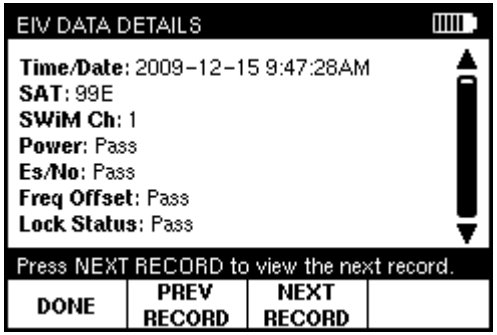
A setup record is generated each time the setup information is updated for the account or an EIV or Transponder Survey is performed. This record shows the new setup information (including ODU, switch, and zip code), as well as the time and date when the change was made or the test was performed.

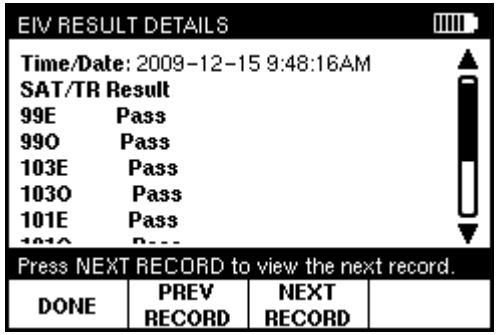
## User Records

A user record is generated each time the registration information is updated for the AIM or an EIV or Transponder Survey is performed. This record shows the registration information (installer name, phone, and company), as well as the time and date when the change was made or the test was performed.

## Test Records

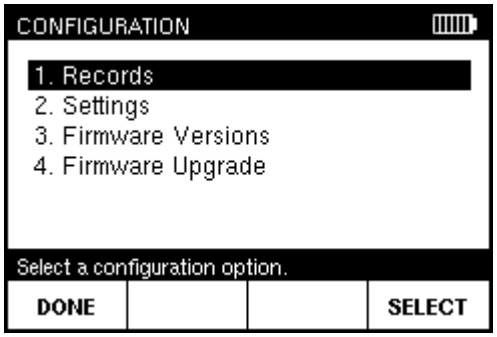
A test record is generated each time an EIV or Transponder Survey is performed. This record shows summary information about the test, including the time and date, ODU and equipment configuration for the installation, the location where the test was performed, the account number, and notes (if applicable). One example is shown.

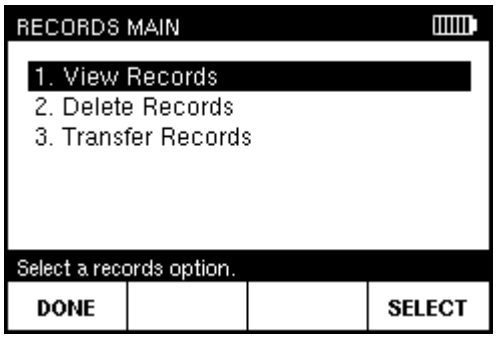


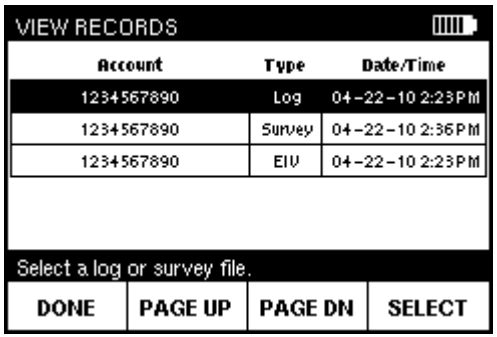




## Data Records

Several data records are generated each time an EIV or Transponder Survey is performed. Data records show the detailed test results for individual transponders and SWiM channels (if applicable). Two examples are shown.




## Viewing Records

You can view all records generated for each account number.

To view records:

1 Press **CONFIG** to go to the **CONFIGURATION** screen.

2 Use ▲ or ▼ to highlight **Records** and press **SELECT** to go to the **RECORDS MAIN** screen.

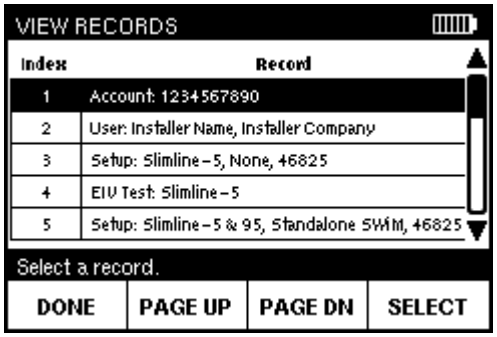
3 Use ▲ or ▼ to highlight **View Records** and press **SELECT** to go to the **VIEW RECORDS** screen.

4 Use ▲ or ▼ to highlight the log file or survey file that contains the records you want to view and press **SELECT**.

*To view log file records*, go to Step 5.

*To view survey file records*, go to Step 6.

*To view EIV file records*, go to Step 7.

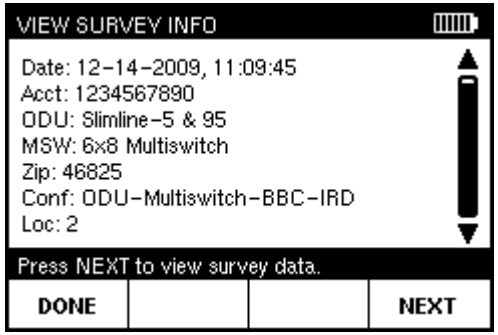


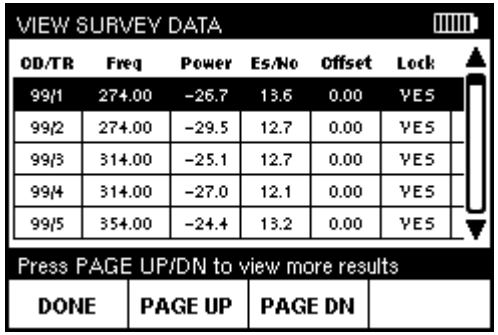

**Tip:** Use **PAGE UP** and **PAGE DN** to scroll quickly through the records.

5 *If you selected a log file*, use ▲ or ▼ to highlight the record that you want to view and press **SELECT**.

The record you selected appears. (See "Understanding Records" on page 66 for more information on record types.)

You can press **NEXT RECORD** or **PREV RECORD** to go to the next or previous record in the log file.

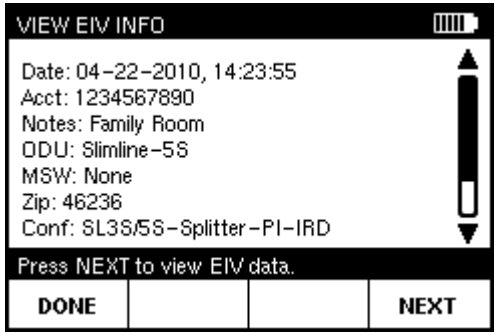


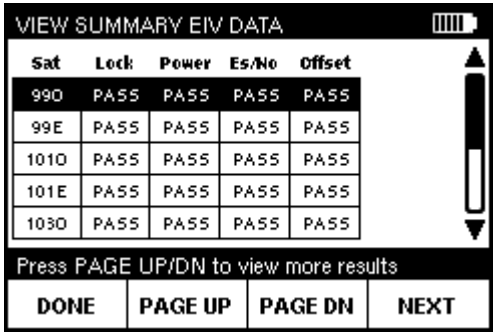


VIEW SURVEY DATA
OD/TR Freq Power Es/No Offset Lock
99/1 274.00 -26.7 13.6 0.00 YES
99/2 274.00 -29.5 12.7 0.00 YES
99/3 314.00 -25.1 12.7 0.00 YES
99/4 314.00 -27.0 12.1 0.00 YES
99/5 354.00 -24.4 13.2 0.00 YES
Press PAGE UP/DN to view more results
DONE
PAGE UP
PAGE DN

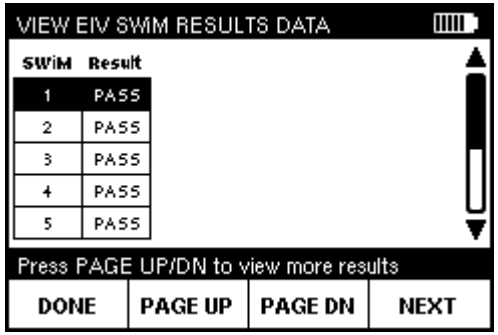
**Tip:** Use **PAGE UP** and **PAGE DN** to scroll quickly through the test results.

6 *If you selected a record from a survey file*, the **VIEW SURVEY INFO** screen appears.

You can press **NEXT** to view the data record for the Transponder Survey on the **VIEW SURVEY DATA** screen.

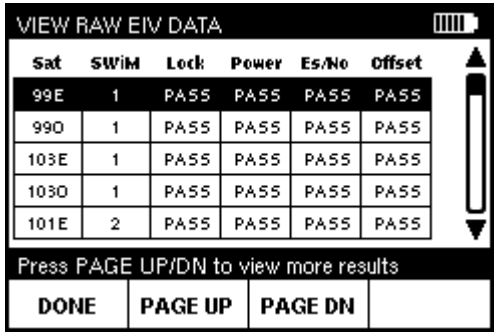



**7** *If you selected a record from an EIV file*, the **VIEW EIV INFO** screen appears.

You can press **NEXT** to view the data records for the EIV on the **VIEW SUMMARY EIV DATA** screen, **VIEW EIV SWiM RESULTS DATA** screen (SWiM installations only) and **VIEW RAW EIV DATA** screen (SWiM installations only).


VIEW RAW EIV DATA
Sat SWM Lock Power Es/No Offset
99E 1 PASS PASS PASS PASS
99O 1 PASS PASS PASS PASS
103E 1 PASS PASS PASS PASS
103O 1 PASS PASS PASS PASS
101E 2 PASS PASS PASS PASS
Press PAGE UP/DN to view more results
DONE
PAGE UP
PAGE DN

8 To view another record, press **DONE** to go to the VIEW RECORDS screen and select another record.

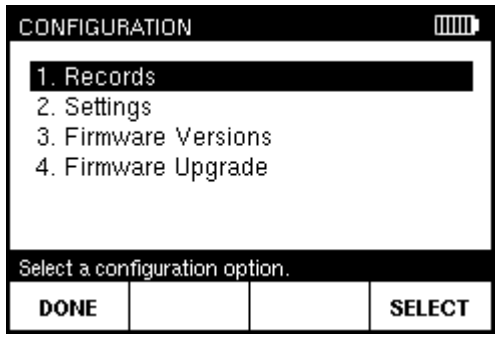
## Deleting Records

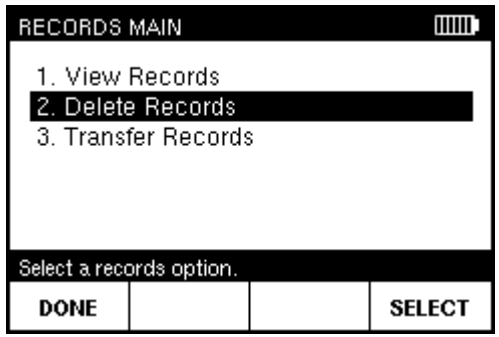
You can delete a single log file or survey file, or all record files for all accounts.

To delete records:

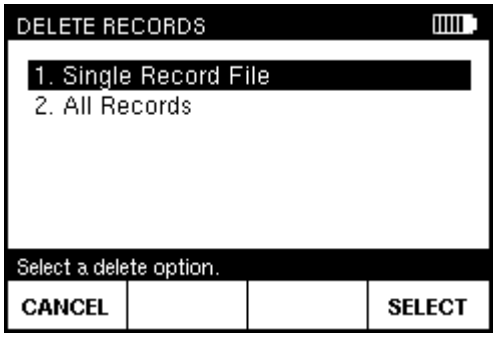
1 Press **CONFIG** to go to the **CONFIGURATION** screen.

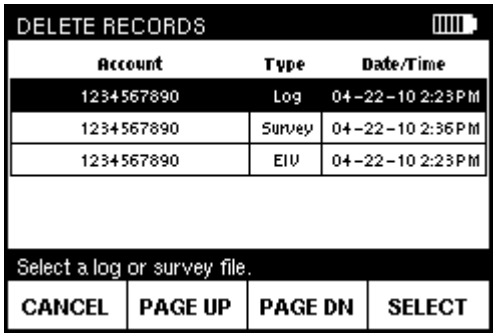
2 Use ▲ or ▼ to highlight **Records** and press **SELECT** to go to the **RECORDS MAIN** screen.




3 Use ▲ or ▼ to highlight **Delete Records** and press **SELECT** to go to the **DELETE RECORDS** screen.




**Tip:** Use **PAGE UP** and **PAGE DN** to scroll quickly through the record files. Press **DONE** to return to **RECORDS MAIN** without deleting a record file.

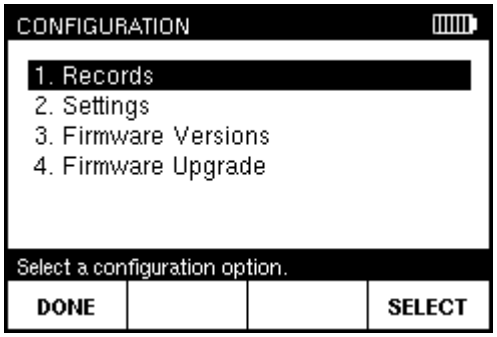
**4** *To delete a single record file*, use ▲ or ▼ to highlight **Single Record File** and press **SELECT**. Go to Step 5.

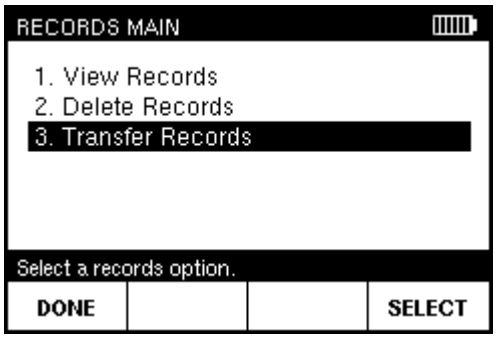
*To delete all record files*, use ▲ or ▼ to highlight **All Records** and press **SELECT**. A message appears to confirm the deletion. Go to Step 6.

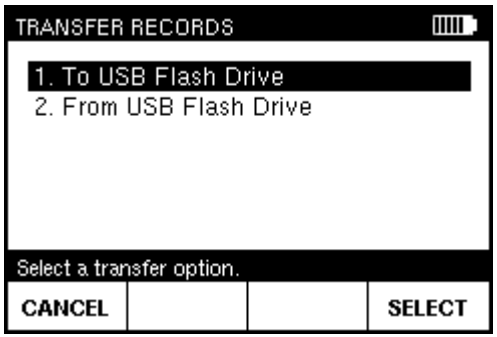
**5** Use ▲ or ▼ to highlight the log file or survey file that you want to delete and press **SELECT**. A message appears to confirm the deletion.

**6** Press **OK** to delete the selected records.

The records are deleted, and the **RECORDS MAIN** screen appears.




## Transferring Records

You can transfer records from your AIM to a PC using a USB flash drive. You also can transfer records from a USB flash drive to the AIM.

You can transfer a single log file or survey file, or all record files for all accounts.

To transfer records:

1 Press **CONFIG** to go to the **CONFIGURATION** screen.

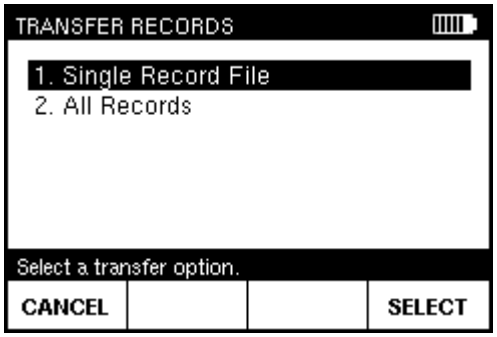
2 Use ▲ or ▼ to highlight **Records** and press **SELECT** to go to the **RECORDS MAIN** screen.

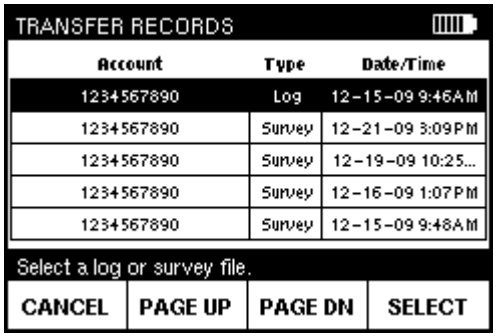
3 Use ▲ or ▼ to highlight **Transfer Records** and press **SELECT** to go to the **TRANSFER RECORDS** screen. A message appears stating to insert the USB flash drive.

4 Insert the USB flash drive into the appropriate USB connector on the meter. The press **OK** to go to the **TRANSFER RECORDS** screen.

5 *To transfer records from the AIM to a USB flash drive,* use ▲ or ▼ to highlight **To USB Flash Drive** and press **SELECT** to continue.

*To transfer records to the AIM from a USB flash drive,* use ▲ or ▼ to highlight **From USB Flash Drive** and press **SELECT** to continue.




**Tip:** Use **PAGE UP** and **PAGE DN** to scroll quickly through the record files.

6 *To transfer a single record file*, use ▲ or ▼ to highlight **Single Record File** and press **SELECT**. Go to Step 7.

*To transfer all record files*, use ▲ or ▼ to highlight **All Records** and press **SELECT**. Go to Step 8.

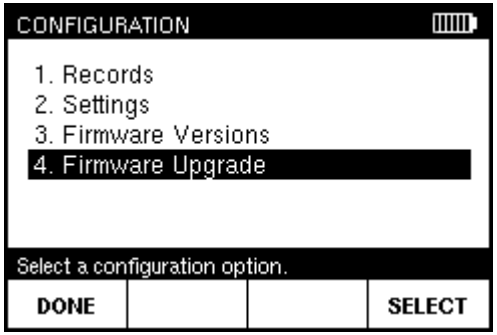
7 Use ▲ or ▼ to highlight the log file or survey file that you want to transfer and press **SELECT**.

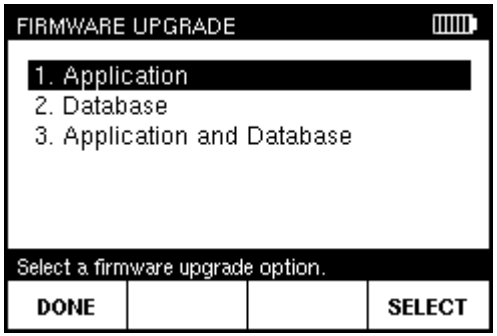
8 *If you are transferring records from the AIM to a USB flash drive,* press **MOVE** to transfer the records and delete them on the AIM, or press **COPY** to transfer the records and retain a copy of each record on the AIM.

The records are transferred, and the **RECORDS MAIN** screen appears.

# 8 Updating the Meter

**Tip:** To view the current AIM firmware version, press **CONFIG** to go to the **Configuration** screen. Then use ▲ or ▼ to highlight **Firmware Versions** and press **SELECT**.



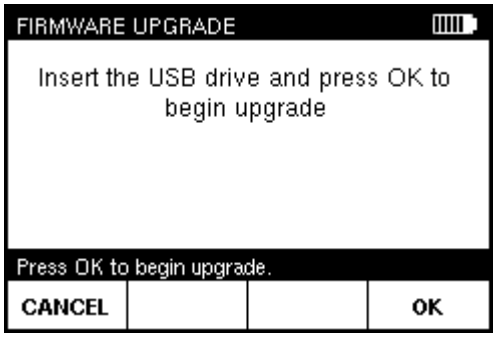




You can update your AIM as new features become available. You can update the AIM application, the AIM's database (which includes reference information used by the AIM), or both the application and database.

When you update the meter firmware, you must plug the AIM into a power outlet using the AC power adapter.

To update the firmware:

1. Plug the AC power adapter into a power outlet. Plug the other end of the power adapter into the AIM's power input connector.
2. Press **CONFIG** to go to the **CONFIGURATION** screen.
3. Use ▲ or ▼ to highlight **Firmware Upgrade** and press **SELECT** to go to the **FIRMWARE UPGRADE** screen.
4. Use ▲ or ▼ to highlight the type of update you want to perform and press **SELECT**.




5 Insert the USB flash drive that contains the firmware upgrade in the appropriate USB connector on the meter. Wait for 15 seconds, then press **OK**.

The firmware update process begins. A message appears when the firmware update is complete.

6 Press **OK** to turn off and restart the meter.

After the meter turns on and the **HOME** screen appears, you can remove the USB flash drive from the meter's USB connector.

# A Glossary

| | |
|---|---|
| **azimuth** | The angular distance (side to side) from true north along the horizon of an ODU to a selected satellite. |
| **BBC** | B-band Converter<br>A Ka-band RF converter that allows viewing of high definition channels with some IRDs. |
| **carrier-to-noise ratio (Es/No)** | A measure of the received carrier strength relative to the strength of the received noise, which is an indication of the quality of the signal (in dB). |
| **dithering** | A process used with Slimline ODUs to make fine adjustments in the azimuth and elevation directions to hone signal power. |
| **EIV** | Extended Installation Verification<br>An automated process for using the AIM to confirm proper alignment of an ODU. |
| **elevation** | The angular distance (up and down) above the horizon of an ODU to a selected satellite. |
| **IRD** | Integrated Receiver Decoder<br>Integrated receiver with a built-in decoder for unscrambling subscription channels. Also called satellite receiver and set-top box. |
| **LNB** | Low-Noise Block Downconverter<br>Component located at the end of the arm projecting from an ODU that receives the signals sent by the satellite and converts them to a lower frequency that can be accepted by a compatible satellite receiver. |

| | |
|---|---|
| **multiswitch** | Device that splits up the satellite feed without compromising quality to support multiple IRDs. |
| **ODU** | Out-Door Unit<br>Term used to collectively refer to the satellite equipment, including the satellite dish, that is placed outside a building. |
| **orbital slots** | The location of geostationary satellites around the globe. |
| **signal power** | A measure of the strength of the radio frequency signal being received from a selected satellite transponder. |
| **SWiM** | Single-Wire Multiswitch<br>Technology that allows distribution of satellite signals on a single cable. |
| **tilt** | Rotational adjustment to compensate for the Earth's curvature between the ODU and a satellite's signal beam. |
| **transponder** | A receiver/transmitter on a satellite, which receives a microwave signal from earth, amplifies it, and retransmits it back to earth at a different frequency. A satellite has several transponders. |

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